

**Bias in Corps of Engineers Inland Navigation
Traffic Forecasts and Recent Congressional
Testimony
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"I know that most men, including those at ease with problems of the greatest complexity, can seldom accept even the simplest and most obvious truth if it be such as would oblige them to admit the falsity of conclusions which they have delighted in explaining to colleagues, which they have proudly taught to others, and which they have woven, thread by thread, into the fabric of their lives." - Leo Tolstoy

Introduction

Probably no better case of the self-serving bias towards large-scale, expensive, structural solutions in the U.S. Army Corps of Engineers' forecasting of future inland waterway system traffic can be made than by the Corps itself. In August 2000, the Corps' Institute for Water Resources compiled a report entitled "Projected and Actual Traffic on Inland Waterways" in response to a request from the House Energy and Water Appropriations Subcommittee during budget deliberations. The report provided, for the record, a comparison of the original waterway traffic projections for inland waterways across the Nation with the actual traffic levels realized on those waterways.

General Robert Flowers, the latest Chief of Engineers, has frequently cited this report in recent Congressional testimony. On March 15, 2001, he testified before the Senate Committee on Environment and Public Works, and elsewhere using this report to strengthen his assertion that there was no bias in Corps planning documents and reports. Nothing could be further from the truth.

Without exception, all of the traffic forecasts supporting authorization of specific projects evaluated in the Corps report overestimate the future inland navigation traffic trends when compared to the most recent actual traffic data currently available.

Moreover, the self-selection of the forecasts examined by the Corps in that report, itself further evidences a very strong bias. The report focuses on

Corps forecasts made outside of the construction authorization process, i.e., forecasts in which the Corps had no budgetary stake in the outcome. The report omits from analysis Corps forecasts used in supporting authorization of recently authorized, completed, and ongoing large-scale, expensive, structural inland navigation projects in the face of declining or stagnant traffic levels.

Finally, an objective evaluation of historic and current inland navigation domestic traffic data yields a much different picture than that painted by General Flowers in his testimony regarding the prospects for robust future growth in inland navigation system levels of use. General Flowers testified before Congress that waterborne commerce would double by 2020. As recently as March 1, 2001, General Hans VanWinkle, the Director of Civil Works for the Corps of Engineers, told the 2001 Inland Waterway Conference that the Corps expected traffic levels to "double or triple in tonnage in the next twenty years." These biased statements directly conflict existing Corps of Engineers data regarding historic and current growth in domestic inland navigation traffic.

Bias in the Corps Report

A detailed examination of the forecasts presented in the Corps report leads to a much different conclusion regarding forecast accuracy and bias than the self-serving conclusion of no bias arrived at by the Corps for three fundamental reasons:

- 1) The Corps reported only on a self-selected subset of waterway forecasts and evaluated these forecasts themselves using a criteria they established to determine forecast accuracy. They did not examine or attempt to examine a complete sample of forecasts used in inland navigation authorizing feasibility studies. In effect, the Corps biased the sample of forecasts to be examined by them for their bias.
- 2) The majority of these self-selected forecasts are not projected traffic levels for waterways at the time navigation improvements were first proposed for authorization or the earliest projections available as requested by the subcommittee, but are instead forecasts and surveys completed after the waterways had already been authorized for improvement. Including forecasts where no construction recommendation is at stake, biases the sample of forecasts towards forecasts less subject to construction bias.
- 3) The self-selected forecasts are evaluated for accuracy only by comparing their predicted traffic levels for 1998

with actual traffic levels in 1998 thereby completely disregarding the possibly large differences between intermediate traffic forecast levels and realized traffic levels. This biases the evaluation of the forecasts by reducing the chances that a forecast will be declared inaccurate by ignoring the relationship between the forecasted time path of traffic and the growth of actual traffic levels.

The Corps report states, "During the recent budget testimony before the House Energy and Water Appropriations Subcommittee, the U. S. Army Corps of Engineers (USACE) was asked to provide for the record a comparison of the original waterway traffic projection for other inland waterways across the Nation versus the actual traffic realized for these waterways." The report goes on to state "the subcommittee asked the USACE to show the traffic projected for waterways at the time navigation improvements were first proposed for authorization or the earliest projections available."

This is a straightforward request for comprehensive data regarding traffic forecasts across the Nation. How did the Corps respond? Rather than risk an independent evaluation of possible bias in their traffic forecasts, the Corps studied itself for bias. Not surprisingly, the Corps concluded that they were not biased in forecasting waterway traffic and gave themselves high marks for forecasting accuracy. The Corps report examines the following self-selected 15 traffic forecasts identified below by the year of the forecast for ten different river systems:

- The Ohio River (1968, 1980);
- The Tennessee River (1969, 1989);
- The Lower Mississippi River (1974);
- The J. Bennett Johnston (Red River) Waterway (1983);
- The Gulf Intracoastal Waterway (1978);
- The Columbia-Snake Waterway (1958, 1977);
- The Missouri River (1950, 1953);
- The Tennessee-Tombigbee Waterway (1945, 1986);
- The Black Warrior-Tombigbee Navigation System (1983); and
- The McClellan-Kerr Arkansas River Navigation System (1943).

The Corps report then concludes, "Eleven of the 15 projections that could be readily compared against actual traffic either forecast total traffic to within a reasonable degree of actual total tonnage in 1998, or underestimated future traffic growth by more than 15 percent, meaning actual traffic growth exceeded what was forecast to occur." The Corps defined a reasonable forecast to be a forecast when 1998 traffic levels

were within 15 percent of forecast traffic levels. Note that this criterion is a relatively easy target to achieve given that the existing traffic base is included in both the forecasted and future realized traffic levels and no mention is made of evaluating intermediate traffic levels and forecasts.

An examination of the studies behind these forecasts reveals that only six of the 15 forecasts were used in studies authorizing Corps inland navigation system projects. These six forecasts are the 1943 McClellan-Kerr Arkansas River Navigation System forecast, the 1945 Tennessee-Tombigbee Waterway forecast, the 1968 Ohio River forecast, the 1977 Columbia-Snake Waterway forecast, the 1983 Black Warrior-Tombigbee Navigation System forecast, and the 1989 Tennessee River forecast.

Further examination reveals that the 1945 forecast of Tennessee-Tombigbee traffic is not really a forecast of total traffic levels but rather an estimate of tonnages that could be diverted from existing (in 1945) modes of transportation. Eliminating the ten forecasts in the Corps report not associated with authorizing studies leaves five forecasts of total traffic for five waterways, which are summarized in the table below using the data in the Corps report.

WATERWAY	FORECAST YEAR	1998 FORECAST (TONS IN 000=S)	1998 TRAFFIC (TONS IN 000=S)	DIFFERENCE (TONS IN 000=S)
MK Arkansas	1943	12,720	12,036	-684
Ohio	1968	264,700	241,900	-22,800
Columbia	1977	15,121	10,850	-4,271
Black	1983	56,020	24,169	-31,851
Tennessee	1989	51,900	52,000	100

Only one of the five authorizing forecasts examined in the Corps report had traffic greater than or equal to the forecast level in 1998. Further, had the Corps used 1999 actual traffic levels rather than 1998 levels, not a single one of the five waterways would have met traffic expectations. For example, traffic on the McClellan-Kerr dropped to an estimated 11.7 million tons in 1999 and traffic on the Tennessee River decreased to an estimated 51.8 million tons in 1999 while the forecast tonnage would have increased above the 1998 forecast level of 51.9 million tons.

Bias in What the Corps Report Excluded and Congressional Testimony

All of the forecasts examined by the Corps, were completed prior to 1990,

yet the Corps has produced numerous inland navigation system feasibility reports and had numerous inland navigation projects (mostly on the Ohio River Navigation System) authorized by Congress in subsequent Water Resource Development Acts. Why were these more recent authorizing forecasts excluded from the Corps report, especially in light of the fact that the Corps included selected, extraneous, non-authorizing forecasts for evaluation?

Many other improved rivers and inland waterways were not included in the group of waterways examined in the Corps report. For example, conspicuously absent from the Corps analysis of its own self-selected forecasts are the Allegheny, Apalachicola, Atchafalaya, Atlantic Intracoastal, Big Sandy, Cumberland, Green and Barren, Gulf Intracoastal East, Kanawha, and Monongahela Rivers and Waterways. Why are these other improved waterways, some of which have feasibility studies completed since 1990, omitted from the analysis submitted by the Corps?

Since 1990 the Corps has recommended for authorization, begun construction, or completed construction of many large-scale, expensive, structural projects on the Kanawha River (Marmet Locks and Dam, Winfield Locks and Dam), Monongahela River (Gray's Landing Locks and Dam, Point Marion Locks and Dam, Monongahela Locks and Dams 2, 3 and 4), Ohio River (Robert C. Byrd Locks and Dam, Olmsted Locks and Dam, McAlpine Locks and Dam, John T. Meyers Locks and Dam, Greenup Locks and Dam), McClellan-Kerr Waterway (Montgomery Point Lock and Dam) , and Gulf Intracoastal Waterway-East (Inner Harbor Navigation Canal Lock). None of the traffic forecasts completed for these feasibility studies were included in the Corps report for evaluation.

The table below displays traffic on all the major developed inland navigation waterways and rivers from 1994 through 1999. The data is gathered from the Navigation Data Center website published by the Corps of Engineers. The average annual growth rate in traffic for the period is computed and also displayed for each waterway. The data are striking in that most waterways and rivers exhibit very low recent growth rates. In fact, many waterways and rivers evidence significant negative growth over the period. The very low and negative growth rates exhibited for waterways with recent project authorizations would call into question the need and economic justification for the recently authorized projects. These growth rates, which were excluded from the Corps evaluation of traffic forecasts, do not correspond with the robust growth rates used to justify ongoing construction projects.

Historic Navigation Traffic on Developed Waterways and Rivers

Year	Millions of Tons			Annual Growth Rate		
	1995	1996	1997	1998	1999	
Alabama-Coosa	0.8	0.7	0.7	0.7	0.6	-3.3
Allegheny	3.5	3.3	3.9	3.9	4.0	2.7%
Apalachicola	0.6	0.6	0.5	0.4	0.3	-9.6%
Atchafalaya (Upper)		9.8	10.6	12.5	13.6	8.4%
Atlantic Intracoastal	3.9	4.3	3.6	3.8	3.4	-0.6%
Big Sandy		17.7	18.2	19.8	20.9	3.8%
Black Warrior	25.6	24.9	25.4	24.2	20.0	-1.4%
Columbia	19.0	18.5	19.1	17.2	17.7	1.4%
Cumberland	17.7	17.2	23.7	23.5	24.2	-7.3%
Green and Barren		7.7	7.3	5.9	4.5	-8.5%
Gulf Intracoastal	119.4	118.0	118.8	113.8	109.5	-1.2%
Illinois	49.9	46.2	43.0	41.8	43.7	-4.3%
Kanawha	23.6	24.8	24.8	23.0	21.4	-0.6%
McClellan-Kerr	10.4	10.6	11.2	12.0	11.7	3.6%
Mississippi	321.3	319.6	323.4	324.5	329.5	0.2%
Missouri	6.9	8.2	8.2	8.4	9.3	5.0%
Monongahela	34.5	36.6	37.2	36.8	37.7	1.6%
Ohio	235.4	237.7	240.4	242.9	240.8	0.8%
Snake	6.8	5.7	6.1	5.8	5.8	3.9%
Tennessee	46.9	45.5	48.6	52.1	51.8	0.8%
Tennessee Tombigbee	8.2	8.0	8.2	8.5	8.0	0.9%

Examination of data contained in the report entitled, "Waterborne Commerce of the United States Calendar Year 1999," published by the Corps of Engineers' Institute for Water Resources yields even more insight into the possible reasons for excluding more recent forecasts and other inland waterways from exposure in the Corps report.

The chart below displays the total annual volume of United States

domestic waterborne commerce measured in tons from 1960 through 1999. *(For a copy please call PEER at 202-265-7337.)*

Note that since the late 1980's domestic waterborne commerce traffic levels have been stagnant or declining. This evidence of stagnation in the growth of inland navigation system traffic demands is notably absent from the Corps report of recent forecasts of robust traffic growth used in support of recently authorized or constructed projects.

Even more insight can be gained by examining the year-to-year changes in the tonnage data. The next chart displays the annual change in total domestic waterborne tonnage from 1961 through 1999. The chart also contains a simple regression of the trend line of the annual change in total traffic as a function of time. *(For a copy please call PEER at 202-265-7337.)*

This chart not only reinforces the evidence that domestic traffic levels have been stagnant or declining since the late 1980's, but seems to suggest that levels of system use by domestic waterborne commerce could be decreasing at an increasing rate for the foreseeable future.

This historic data is squarely at odds with Generals Flowers' and VanWinkle's assertions in testimony and elsewhere that inland waterborne commerce is expected to double or triple by 2020. For domestic traffic levels to double by 2020, domestic traffic would have to increase at an average rate of over 50 million tons per year for 21 years. Only twice since 1961 has traffic ever increased that much in any year, much less average that magnitude of an increase over a 20-year period. Absent a sea change in the economic forces driving the demand for domestic inland waterborne transportation not only will traffic not double or triple by 2020, but it will most likely continue to decrease or remain stagnant.

These recent forecasts of future traffic for these improved river systems and waterways were not included in the Corps report on its own forecasting abilities precisely because their inclusion would demonstrate the very biases permeating the Corps analyses which the Chief of Engineers has denied exist in his testimonies before Congressional committees over the past three months.