

STB

FD

33388

ID-184826

12-15-97

D

26/60

LEVEL 1 - 41 OF 355 STORIES

Copyright 1997 Times Publishing Company
St. Petersburg Times

September 4, 1997, Thursday, 0 South Pinellas Edition

SECTION: BUSINESS; Pg. 1F

LENGTH: 859 words

HEADLINE: Bank deal may mean bigger job cuts

BYLINE: ERIC TORBENSON

BODY:

NationsBank Corp.'s chief executive Hugh McColl said Wall Street is overestimating job cuts that will follow the acquisition of Barnett Banks Inc.

But some are skeptical, noting that the combined bank will have to cut deep to reach McColl's projected savings. Indeed, some analysts have doubled their earlier forecasts for job cuts in NationsBank's buyout of Barnett.

Lawrence Cohn of Ryan Beck & Co. in Orange, N.J., thinks NationsBank will cut between 10,000 and 12,000 jobs, twice what he predicted last week. He raised his number after learning more about McColl's cost-cutting plans.

"NationsBank wants to cut 55 percent," Cohn said. "That's usually a good indicator of the percentage of people who are going to lose their jobs. I mean, they're talking about closing three, four hundred branches. Each branch has a manager, and assistant manager, a lot of loan officers. That's a lot of people."

Richard M. Bove of St. Petersburg's Raymond James & Associates Inc. agrees with Cohn's estimate. "To make the deal work, they're going to have to do a lot of cutting. Larry's right on the mark."

The new NationsBank won't need all 1,100 branches or 1,300 cash machines that the two banks now have in Florida, Bove said. NationsBank and Barnett have similar divisions, such as groups that sell various financial products.

McColl said a hiring freeze and attrition at Barnett, coupled with new jobs throughout NationsBank's growing territory, will help cut the actual number of jobs lost. McColl offered that he is continuing to look for expansion opportunities, especially in states like California.

For Barnett and NationsBank employees, it is still unclear what is ahead. Barnett has 22,000 employees, while NationsBank has 60,000 employees in 16 states.

One factor in tallying the job cuts is how many branches NationsBank sells off in the deal. NationsBank will have to sell \$ 3.5-billion worth of assets to



LEXIS·NEXIS®

©



LEXIS·NEXIS®

©



LEXIS·NEXIS®

©

comply with federal banking laws that prohibit a bank from controlling more than 10 percent of an area's deposits.

McColl said the bank has repeatedly shown it knows how to cut costs. NationsBank was able to cut 60 percent of the costs in connection with its \$ 1.69-billion purchase of Bank South Corp., which closed in January 1996, he said.

"We've proven that we know how to do an in-market merger," McColl told Bloomberg News. "We've clearly demonstrated in the Boatmen's merger that we've been able to take more than we indicated."

He referred to NationsBank's purchase of St. Louis-based Boatmen's Bancshares Inc. in January for \$ 9.76-billion.

McColl said NationsBank would take advantage of its size in Florida to reduce expenses with its vendors. "We'll be able to acquire checks, computers, telephone services for lower than other people," he said. "Large companies always have purchasing power."

Many view other acquisitions as a preview of things to come. The June 1995 acquisition of First Interstate Bank by Wells Fargo & Co. resulted in 7,200 jobs cut. Some figure that deal is comparable to the NationsBank-Barnett combination because Wells Fargo overlapped First Interstate territory, which is true for the Barnett buyout.

The biggest layoffs from a merger came from Chase Manhattan Bank's purchase of Chemical Bank, when 12,000 jobs were cut.

NationsBank has about 3,000 jobs now open, said Jerri Franz, Barnett spokeswoman. Barnett employees have already started interviewing for those jobs. Barnett loses 20 percent of its workforce each year. Many of those jobs are in the bank's branches.

John wonders if Barnett's attrition rate might slow down. In most mergers or acquisitions, employees who are asked to leave receive a severance package. "There's going to be a large number of people who wait for the package," he said. "If they leave they're walking away from it."

The flip side of waiting for severance is that careers can slow while waiting for cash, said John Challenger, executive vice president of the Chicago outplacement firm Challenger, Gray and Christmas Inc.

"Leaving your career stalled six months or a year for this may not be the best thing," he said. "We call it the golden handcuffs."

Those lost in the merger won't just be from Barnett, Challenger predicts. Barnett workers in the bank's strongest areas may end up displacing their NationsBank counterparts in Florida, he said.

Though working for NationsBank may not inspire the same kind of "bleed green" loyalty that Barnett workers have, it will likely look good on a resume, Challenger said. Banks around the world are getting larger, and working at what would become the country's third largest bank would help most bank employees.



LEXIS·NEXIS®



LEXIS·NEXIS®



LEXIS·NEXIS®

St. Petersburg Times, September 4, 1997

"It's a lot easier to go from a big bank to a smaller bank," he said. "But if you want to stay in banking, you're likely going to have this happen where you'll end up being bought up by a bigger bank."

NationsBank Stock closed down 44 cents at \$ 58.31, while Barnett's shares rose 19 cents to \$ 66.94.

- Information from Bloomberg News was used in this report.

GRAPHIC: COLOR PHOTO; Hugh McColl

LANGUAGE: ENGLISH

LOAD-DATE: September 5, 1997



LEXIS·NEXIS



LEXIS·NEXIS



LEXIS·NEXIS

EXHIBIT F

VOTE FOR JIM HANTZ DISTRICT CHAIRMAN LODGE 697

I have the experience, knowledge, and desire necessary to be the District Chairman of Lodge 697 and if elected I will do everything in my power to restore confidence and responsibility to our Local and System Board.

QUALIFICATIONS

Local Chairman in Chicago under the C&O Agreement for four years prior to relocating to Jacksonville in 1989 at this time I also attended classes at the George Meany Institute of Labor Studies in Rockville, MD.

Elected, by my peers, to the position of Vice-General Chairman responsible for overseeing the States of Michigan, Wisconsin, Indiana, Illinois and Kentucky.

I have participated in negotiations between the carrier and the Union in Rockville, Maryland - Richmond, Virginia, - Chicago, Illinois and Cincinnati, Ohio.

Was an Inner Guard at the Nation Convention held in Miami, Florida.

Since relocating to Jacksonville I was elected to the position of District Chairman, Royal Palm Lodge 1523. Holding this position for four years.

Elected, by my peers, to the Appeals Committee on the System Board, participated in Claims Conferences and appointed to serve on the Laws and Rules Committee at the National Convention held in San Francisco, California.

Have worked closely with all members of the System Board in Jacksonville and have personal friends at the Grand Lodge in Rockville and C & O System Board in Richmond.

ACCOMPLISHMENTS

While in Chicago:

Secured rates of pay for waybillers that were higher than SCL, LN or B&O rates.

Established a move package for employees relocating to Jacksonville that locked in their higher rates of pay and allowed for round trip air fair for employees interested in the relocation.

Organized a roll down that allowed 60 clerks New York Dock protection from a single displacement.

Split Lodge 1523 so the people at Crew Management Center would have their own District Chairman.

Protected Red Circle rates for employees that allowed them to switch jobs and not lose money.

Kept the Carrier from establishing a Dress Code at South Point and having to pay for parking. Members of Lodge 1523 were also allowed to participate in the 401 K plan.

Only one investigation was held during this time and that was on an employee who was charged before relocating to Jacksonville.

Filed numerous claims against the carrier, one of which was filed on behalf of a senior employee who was not allowed to work under the pool system. This claim was taken to a law board and upheld and has resulted in over \$300,000. 00 in awards.

Was available 24 hours a day, 7 days a week.

IF ELECTED

I will work toward the splitting of this lodge so the members are afforded the representation they desire.

Oppose the Carriers policy for absenteeism which has no basis in our Union Agreement.

Develop lines of communication by establishing working Protective Committees which are open to any interested union member. Actively seek your input into any negotiations. Not have any meetings with the Carrier without a member of the Protective Committee being present.

Represent all Lodge members equally to the best of my abilities 24 hours a day 7 days a week. If it is a problem to you it is important to me.

Questions or comments contact me at 282-8420 (Home) or extension 4921 (Work) 7:00 A.M. - 3:00 P.M. Tuesday - Saturday.

Sincerely and Fraternally,

James J. Hantz
Candidate for District Chairman

*** TOTAL PAGE.03 ***

EXHIBIT G

EXAMPLES OF ICC/STB COORDINATIONS ON CSX WHERE EMPLOYEES
WERE CONSOLIDATED UNDER A SINGLE COLLECTIVE BARGAINING AGREEMENT

<u>YEAR</u>	<u>TRANSACTION</u>	<u>UNION</u>	<u>ORIGINAL CBAS</u>	<u>CBA TO WHICH TRANSFERRED</u>
1980	Richmond Coordination	BRC	SCL; C&O	C&O
1981	Terminal coordination - E. St. Louis	UTU	L&N; B&O	L&N
1981	SCL and C&O coord. at Richmond, Newport News & Portsmouth	TCU	SCL; C&O	C&O
1981	L&N & C&O Coord. - Lexington and Winchester	TCU	L&N; C&O	L&N
1981	B&O and L&N Coord. at Lou.	TCU	B&O; L&N	L&N
1981	B&O & L&N Coord. at E. St. Louis	TCU	B&O; L&N	B&O
1983	Wheel shop work from Glenwood to Louisville	BRC	B&O; L&N	L&N
1984	Consolidation of repair work at Cincinnati terminal	IAM	B&O; C&O; L&N	B&O
1984	Consolidation of work at Cincinnati	SMWIA	B&O; C&O	B&O
1984	Consolidation of work at Cincinnati terminal	IBF&O	B&O; L&N	B&O
1984	Consolidation of communi- cation work at Cincinnati terminal	IBEW; TCU	B&O; C&O; L&N	B&O
1984	Coordination of electri- cal road force work at Cincinnati	IBEW	B&O; C&O; L&N	B&O
1984	Transfer of locomotive wheelwork from Cumberland to S. Louisville	IAM	B&O; L&N	L&N
1984	Transfer of air brake work from Louisville to Raceland	BRC	L&N; C&O	C&O

<u>YEAR</u>	<u>TRANSACTION</u>	<u>UNION</u>	<u>ORIGINAL CBAS</u>	<u>CBA TO WHICH TRANSFERRED</u>
1984	L&N & C&O Coord. - Decoursey & Cincinnati	TCU	B&O; L&N	C&O
1984	C&O signal employees and maintenance work to L&N	BRS	C&O; L&N	L&N
1984	Cincinnati terminal	TCU; IBEW	B&O; C&O	B&O
1984	Consolidation of work at Cincinnati terminal	BRC	B&O; L&N	B&O
1984	Toledo terminal	BRS; IBEW	C&O; B&O; TTRR	C&O
1984	Terminal coordination - Augusta	UTU	SCL; GA	SCL
1985	Road coordination	UTU	L&N; CRR	L&N
1985	Terminal Coordination - Athens	UTU	SCL; GA	SCL
1985	RF&P clerks to SCL in Jacksonville	TCU	RF&P; SCL	SCL
1986	Mechanical work from Erwin to Waycross	SMWIA	CRR; SCL	SCL
1986	Terminal Coordination - Athens	BLE; UTU	SCL; GA	SCL
1986	Mechanical, Signal, Engineering, Real Estate Coordination	TCU	SCL; C&O	SCL
1987	Savannah Signal Shop	BRS	SCL; L&N; A&WP; CRR; B&O; C&O; B&OCT	SCL
1987	Machinists from Louisville to Huntington and Waycross	IAM	L&N; C&O; SCL	C&O at Huntington; SCL at Waycross
1987	Signal shop work consolidated on SCL	BRS	SCL; L&N; A&WP; CRR; B&O; WM; B&OCT; C&O	SCL

<u>YEAR</u>	<u>TRANSACTION</u>	<u>UNION</u>	<u>ORIGINAL CBAS</u>	<u>CBA TO WHICH TRANSFERRED</u>
1987	Division managers from Nashville to Atlanta	TCU	SCL; L&N	SCL
1987	Divison managers from Evansville to Chicago	TCU	L&N; C&O	C&O
1987	Division managers from Cincinnati to Corbin	TCU	L&N; C&O	L&N
1987	Clerical functions - Vincennes, IN	TCU	B&O; L&N	L&N
1987	Purchases & Materials - Louisville, Corbin, et. al.	TCU	C&O; L&N	L&N
1988	Consolidation of train dispatching (Phase I)	ATDA	C&O; B&O; L&N; SCL; CRR	New CSXT CBA
1988	Freight car repair work from Lafayette to Evansville	TCU	Monon; L&N	L&N
1988	Carmen from Louisville to Raceland	TCU	L&N; C&O	C&O
1988	Industrial development	TCU	SCL; C&O	C&O
1988	Centralized crew dispatching	TCU	B&O; SCL	SCL
1989	Revenue accounting from Baltimore to Jacksonville	TCU	C&O; SCL	SCL
1989	Central waybilling from Chicago to Jacksonville	TCU	C&O; SCL	SCL
1989	Expenditure billing from Baltimore to Jacksonville	TCU	SCL; C&O	SCL
1989	Centralized crew dispatching	TCU	CRR; C&O; SCL	SCL
1989	Accounts payable from Baltimore to Jacksonville	TCU	C&O; SCL	SCL
1989	Central waybilling from Baltimore to Jacksonville	TCU	B&O; SCL	SCL
1989	Consolidatioin of train dispatching (Phase II)	ATDA	SCL; C&O; B&O; CSXT	CSXT

<u>YEAR</u>	<u>TRANSACTION</u>	<u>UNION</u>	<u>ORIGINAL CBAS</u>	<u>CBA TO WHICH TRANSFERRED</u>
1992	Machinists from Richmond to Huntington and Waycross	IAM	RF&P; C&O; SCL	C&O at Huntington; SCL at Waycross
1992	Freight damage prevention and expenditures billing to Jacksonville	TCU	C&O; B&O; SCL	SCL
1992	Purchasing and material clerks to Richmond	TCU	SCL; B&O; C&O	C&O
1992	Train dispatchers from Richmond to Jacksonville	TCU	RF&P-TCU; SCL-ATDA	SCL-ATDA
1992	Yardmasters from RF&P to Richmond	UTU	RF&P; C&O	C&O
1992	RF&P clerks to Jacksonville and Richmond	TCU	RF&P; SCL; C&O	SCL in Jacksonville C&O in Richmond
1993	TRRY carmen to B&O	TCU	TRRY; B&O	B&O
1993	Sheetmetal workers from TRRY to B&O	SMWIA	TRRY; B&O	B&O
1993	TRRY clerks to B&O and SCL	TCU	TRRY; B&O; SCL	B&O; SCL
1993	Consolidation of train and engine operations into central B&O consolidated district	UTU; BLE	B&O; TRRY; POV	B&O
1995	Consolidation of train and engine operations into eastern B&O consolidated district	UTU; BLE	B&O; C&O; WM; RF&P	B&O
1997	Consolidation of radio repair shop work at Louisville	BRS; IBEW; TCU	C&O (PM); B&O; Clinchfield; C&O (Sou); Monon; C&EI; A&WP/WRA & GA; RF&P; B&OCT; L&N-TCU	L&N-TCU

GLOSSARY

Labor Organizations

ATDA	American Train Dispatchers Dep't of BLE
BLE	Bhd. of Locomotive Engineers
BRC	Bhd. of Railway Carmen
BRS	Bhd. of Railroad Signalmen
IAM	Int'l Ass'n of Machinists and Aerospace Workers
IBEW	Int'l Bhd. of Electrical Workers
IBF&O	Int'l Bhd. of Firemen and Oilers
SMWIA	Sheet Metal Workers Int'l Ass'n
TCU	Transportation Communications Int'l Union
UTU	United Transportation Union

Railroads

A&WP	Atlanta & West Point Railroad Company
B&O	The Baltimore and Ohio Railroad Company
B&OCT	The Baltimore and Ohio Chicago Terminal Railroad Company
C&EI	Chicago and Eastern Illinois Railroad Company
C&O	The Chesapeake and Ohio Railway Company
Clinchfield	Carolina, Clinchfield and Ohio Railway
CRR	The Carrollton Railroad
GA	Georgia Railroad
L&N	Louisville and Nashville Railroad Company
Monon	Monon Railroad
POV	Pittsburgh & Ohio Valley Railway Company
PM	Pere Marquette Railway Company
RF&P	Richmond, Fredricksburg and Potomac Railway Company
SCL	Seaboard Coast Line Railroad Company
TTRR	Toledo Terminal Railroad Company
TRRY	The Three Rivers Railway Company
WM	Western Maryland Railway Company
WRA	The Western Railway of Alabama

EXHIBIT H

**AVERAGE ANNUAL COMPENSATION PER FULL-TIME EQUIVALENT EMPLOYEE
BY INDUSTRY, RANGED FROM HIGH TO LOW
1986**

RANK	INDUSTRY	NO. OF EMPLS. (000)	AVERAGE ANNUAL COMPENS. LOWER	PERCENT EMPLS. WITH COMP.	Class I Railroads
1	Security and commodity brokers	358	\$123,808	98.5%	
2	Holding and other investment offices	258	\$78,835	98.3%	BLE \$63,160
3	Petroleum and coal products	138	\$77,812	98.2%	UTJ \$75,089
4	RAILROAD TRANSPORTATION	212	\$73,231	98.0%	YDM \$73,085
5	PIPELINES, EXCEPT NATURAL GAS	14	\$71,929	98.0%	ATCO \$72,635
6	Tobacco manufactures	42	\$71,782	98.8%	
7	Motor vehicles and equipment	858	\$68,801	98.1%	
8	Chemicals and allied products	1,020	\$68,214	97.2%	
9	Telephone and telegraph	854	\$66,810	98.4%	
10	Legal services	944	\$64,598	95.9%	
11	Electric, gas, and sanitary services	872	\$63,011	94.9%	
12	Metal mining	54	\$62,186	94.8%	BRS \$62,670
13	Oil and gas extraction	315	\$62,029	94.5%	
14	Coal mining	97	\$61,588	94.4%	
15	Federal government	4,388	\$60,835	90.6%	
16	Other transportation equipment	814	\$57,389	89.9%	IAM \$58,953
17	Instruments and related products	843	\$56,837	89.1%	SAW \$56,815
18	Other services	2,855	\$54,573	88.5%	BEW \$55,004
19	Primary metal industries	704	\$53,818	85.9%	TCU \$55,294
20	Insurance carriers	1,447	\$52,433	84.6%	BAWE \$56,129
21	Nondepository institutions	481	\$51,088	84.2%	BRC \$54,381
22	Industrial machinery and equipment	2,072	\$50,764	82.4%	
23	Radio and television	374	\$50,871	82.1%	
24	Paper and allied products	678	\$48,784	81.0%	
25	Electronic and electronic equipment	1,643	\$48,238	80.0%	
26	WATER TRANSPORTATION	188	\$47,580	78.0%	NCFO \$47,974
27	Insurance agents, brokers, and service	707	\$46,433	78.2%	IBB \$46,758
28	Wholesale trade	6,278	\$46,184	73.7%	
29	Nonmetallic minerals, except fuels	106	\$45,948	73.6%	
30	TRANSPORTATION BY AIR	1,043	\$44,575	72.7%	
31	Motion pictures	432	\$43,880	72.3%	
32	Depository institutions	1,921	\$43,819	70.6%	
33	Printing and publishing	1,445	\$43,120	68.4%	
34	Stone, clay, and glass products	833	\$43,002	68.0%	
35	State and local government	13,838	\$42,673	58.7%	
36	Fabricated metal products	1,435	\$42,218	55.3%	
37	Heat-treated metals	8,774	\$40,807	47.7%	
38	TRUCKING AND WAREHOUSING	1,580	\$38,250	46.4%	
39	Construction	5,442	\$38,458	41.6%	
40	Transportation services	388	\$38,046	41.2%	
41	Rubber and miscellaneous plastics products	865	\$37,801	40.4%	
42	Food and kindred products	1,864	\$37,740	38.9%	
43	Real estate	1,273	\$35,278	37.8%	
44	Miscellaneous manufacturing industries	388	\$34,537	37.5%	
45	Miscellaneous repair services	368	\$33,807	37.2%	
46	Business services	6,875	\$32,214	31.1%	
47	Lumber and wood products	782	\$31,754	30.4%	
48	Furniture and fixtures	487	\$31,898	30.0%	
49	Textile mill products	623	\$30,887	28.4%	
50	Educational services	1,868	\$28,230	27.8%	
51	Amusement and recreation services	1,288	\$28,731	28.8%	
52	Leather and leather products	85	\$28,653	28.0%	
53	Auto repair, services, and parking	1,136	\$28,750	25.8%	
54	Local and interurban passenger transit	402	\$28,127	25.2%	
55	Hotels and other lodging places	1,588	\$24,197	23.6%	
56	Apparel and other textile products	846	\$24,089	23.1%	
57	Social services and membership organizations	4,067	\$23,874	18.0%	
58	Retail trade	18,383	\$21,757	3.3%	
59	Agricultural services, forestry, and turndries	1,070	\$21,714	2.6%	
60	Farms	757	\$21,848	1.7%	
61	Personal services	1,162	\$21,178	0.7%	
62	Private households	788	\$14,388	0.0%	
	Domestic industries	113,810	\$38,988		

SOURCE: SURVEY OF CURRENT BUSINESS, U. S. Department of Commerce, August 1987.

**AVERAGE ANNUAL COMPENSATION PER FULL-TIME EQUIVALENT EMPLOYEE
BY INDUSTRY, RANKED FROM HIGH TO LOW
1985**

RANK	INDUSTRY	NO. OF EMPL.	AVERAGE ANNUAL COMPS. (000)	PERCENT EMPLS. WITH LOWER COMP.	Class / Ratios
1	Security and commodity brokers	533	\$111,538	99.5%	
2	Petroleum and coal products	142	\$76,288	99.4%	BLE \$80,800
3	Holding and other investment offices	238	\$73,837	99.2%	ATDO \$75,629
4	Tobacco manufactures	42	\$70,214	99.1%	UTU \$73,070
5	PIPELINES, EXCEPT NATURAL GAS	15	\$70,067	99.1%	YDM \$71,627
6	RAILROAD TRANSPORTATION	220	\$68,805	98.9%	
7	Motor vehicles and equipment	900	\$68,471	98.1%	
8	Telephone and telegraph	637	\$64,199	97.3%	
9	Chemicals and allied products	1,027	\$63,874	96.4%	
10	Legal services	937	\$62,255	95.8%	
11	Electric, gas, and sanitary services	885	\$61,183	94.8%	
12	Metal mining	52	\$60,481	94.7%	BRS \$60,251
13	Oil and gas extraction	315	\$60,082	94.4%	
14	Coal mining	103	\$59,842	94.3%	
15	Other transportation equipment	808	\$47,181	93.6%	
16	Federal government	4,530	\$56,845	88.9%	IBEW \$55,704
17	Instruments and related products	826	\$55,180	88.8%	IAM \$55,153
18	Primary metal industries	688	\$53,383	88.2%	TCU \$54,881
19	Other services	2,807	\$53,271	85.7%	SAW \$54,487
20	Insurance carriers	1,449	\$50,198	84.4%	IBB \$53,882
21	TRANSPORTATION BY AIR	725	\$48,261	83.7%	BRG \$52,837
22	Industrial machinery and equipment	2,050	\$48,215	81.9%	BAWE \$52,386
23	Radio and television	338	\$48,834	81.6%	
24	Nondepository institutions	446	\$48,803	81.1%	
25	Paper and allied products	684	\$48,152	80.5%	
26	Electric and electronic equipment	1,807	\$48,028	79.1%	
27	WATER TRANSPORTATION	187	\$48,984	78.9%	NCFO \$48,574
28	Wholesale trade	8,300	\$44,548	73.4%	
29	Insurance agents, brokers, and service	687	\$44,488	72.8%	
30	Nonmetallic minerals, except fuels	105	\$44,229	72.7%	
31	Motion pictures	383	\$42,842	72.3%	
32	Stone, clay, and glass products	531	\$41,674	71.8%	
33	Printing and publishing	1,450	\$41,846	70.5%	
34	Depository institutions	1,835	\$41,488	68.8%	
35	Fabricated metal products	1,420	\$41,263	67.9%	
36	State and local government	13,797	\$41,117	55.1%	
37	Health services	8,482	\$40,549	47.9%	
38	Construction	5,178	\$37,417	42.9%	
39	TRUCKING AND WAREHOUSING	1,791	\$37,361	41.3%	
40	Transportation services	388	\$37,235	40.9%	
41	Food and kindred products	1,842	\$37,175	39.4%	
42	Rubber and miscellaneous plastics products	862	\$36,717	38.6%	
43	Miscellaneous manufacturing industries	385	\$33,758	36.2%	
44	Real estate	1,252	\$33,682	37.1%	
45	Miscellaneous repair services	343	\$32,790	36.6%	
46	Lumber and wood products	772	\$30,832	36.1%	
47	Furniture and fixtures	502	\$30,783	35.7%	
48	Business services	6,372	\$30,438	29.9%	
49	Textile mill products	654	\$28,945	29.3%	
50	Educational services	1,801	\$28,737	27.7%	
51	Amusement and recreation services	1,231	\$28,047	26.6%	
52	Leather and leather products	108	\$27,085	26.5%	
53	Auto repair, services, and parking	1,061	\$26,230	25.6%	
54	Local and interurban passenger transit	384	\$24,411	25.2%	
55	Hotels and other lodging places	1,518	\$23,825	23.9%	
56	Social services and membership organizations	3,980	\$23,181	20.3%	
57	Apparel and other textile products	820	\$22,822	19.9%	
58	Agricultural services, forestry, and fisheries	997	\$21,487	18.6%	
59	Retail trade	18,029	\$21,250	2.4%	
60	Farms	744	\$20,882	1.8%	
61	Personal services	1,138	\$20,638	0.7%	
62	Private households	819	\$14,433	0.0%	
	Domestic industries	111,423	\$37,855		

SOURCE: SURVEY OF CURRENT BUSINESS, U. S. Department of Commerce, August 1987.

AVERAGE ANNUAL COMPENSATION PER FULL-TIME EMPLOYEE
BY INDUSTRY, RANGED FROM HIGH TO LOW
YEAR 1994

M-1

RANK	INDUSTRY	NO. OF EMPLS. (000)	AVERAGE ANNUAL COMPENS.	PERCENT EMPLS. WITH LOWER COMP.	
1	Security and commodity brokers	523	\$105,096	99.5%	
2	Petroleum and coal products	146	\$72,219	99.4%	BLE \$79,178
3	RAILROAD TRANSPORTATION	225	\$68,671	99.2%	ATDA \$71,588
4	Holding and other investment offices	245	\$68,089	99.0%	UTU \$70,886
5	Motor vehicles and equipment	891	\$67,067	98.2%	RYA \$67,388
6	PIPELINES, EXCEPT NATURAL GAS	17	\$65,529	98.1%	
7	Tobacco manufactures	42	\$64,381	98.1%	
8	Chemicals and allied products	1,041	\$61,339	97.2%	
9	Legal services	882	\$59,919	96.3%	
10	Electric, gas, and sanitary services	914	\$58,594	95.4%	
11	Oil and gas extraction	334	\$58,156	95.1%	BRS \$58,683
12	Coal mining	111	\$58,027	95.0%	
13	Metal mining	49	\$58,020	95.0%	
14	Telephone and telegraph	886	\$58,908	94.2%	
15	Other transportation equipment	844	\$56,602	93.4%	
16	Instruments and related products	852	\$52,811	92.8%	IBEW \$53,836
17	Other services	2,816	\$52,458	90.3%	IAM \$53,440
18	Primary metal industries	693	\$49,654	89.8%	TCU \$53,800
19	Industrial machinery and equipment	1,982	\$48,755	87.8%	SAW \$52,526
20	TRANSPORTATION BY AIR	706	\$48,343	87.2%	IBB \$51,888
21	Insurance carriers	1,470	\$48,000	85.8%	BRC \$51,341
22	Paper and allied products	688	\$46,868	85.2%	MOPW \$50,284
23	Nondepository institutions	489	\$46,595	84.9%	
24	Electric and electronic equipment	1,556	\$46,582	83.4%	
25	Federal government	5,578	\$46,334	78.3%	
26	WATER TRANSPORTATION	169	\$45,343	78.1%	IBFO \$45,100
27	Wholesale trade	5,972	\$43,525	72.7%	
28	Insurance agents, brokers, and service	689	\$43,012	72.1%	
29	Nonmetallic minerals, except fuels	103	\$42,942	72.0%	
30	Radio and television	946	\$42,025	71.6%	
31	Fabricated metal products	1,369	\$40,988	70.4%	
32	Printing and publishing	1,448	\$40,435	69.1%	
33	Stone, clay, and glass products	528	\$40,341	68.6%	
34	Depository institutions	1,873	\$39,228	68.0%	
35	State and local government	13,731	\$38,129	54.3%	
36	Health services	8,378	\$38,724	46.7%	
37	Motion pictures	370	\$38,638	46.3%	
38	Construction	4,988	\$36,725	41.8%	
39	Food and kindred products	1,634	\$36,508	40.3%	
40	TRUCKING AND WAREHOUSING	1,743	\$36,468	38.7%	
41	Rubber and miscellaneous plastics products	841	\$35,883	37.8%	
42	Transportation services	376	\$35,281	37.3%	
43	Miscellaneous manufacturing industries	386	\$33,427	37.1%	
44	Real estate	1,252	\$33,020	36.0%	
45	Miscellaneous repair services	322	\$32,000	35.7%	
46	Lumber and wood products	757	\$30,388	35.0%	
47	Furniture and fixtures	493	\$30,284	34.6%	
48	Business services	5,786	\$28,962	29.3%	
49	Textile mill products	670	\$28,536	29.7%	
50	Educational services	1,713	\$28,382	27.1%	
51	Amusement and recreation services	1,145	\$27,378	26.1%	
52	Auto repair, services, and parking	881	\$26,581	25.2%	
53	Leather and leather products	113	\$26,274	25.1%	
54	Local and interurban passenger transit	377	\$23,676	24.7%	
55	Hotels and other lodging places	1,485	\$23,117	23.4%	
56	Social services and membership organizations	3,813	\$22,380	19.8%	
57	Apparel and other textile products	960	\$22,290	19.0%	
58	Agricultural services, forestry, and fisheries	624	\$21,920	18.2%	
59	Retail trade	17,307	\$21,074	2.4%	
60	Farms	706	\$20,545	1.8%	
61	Personal services	1,118	\$20,189	0.7%	
62	Private households	821	\$13,207	0.0%	
	Domestic industries	109,750	\$36,524		

SOURCE: SURVEY OF CURRENT BUSINESS, U. S. Department of Commerce, January/February 1995.
Railroad Unions from Wage Statistics, Class I Railroads.

G:\FUDCDATA\MS48-84.WB2 03/05/95 01:27 PM

AVERAGE ANNUAL COMPENSATION PER FULL-TIME EMPLOYEE
BY INDUSTRY, RANKED FROM HIGH TO LOW
YEAR 1993

RANK	INDUSTRY	NO. OF EMPLOYEES (000)	AVERAGE ANNUAL COMPENS.	PERCENT EMPLS. WITH LOWER COMP.
1	Security and Commodity Brokers	472	\$114,102	99.55%
2	Holding and Other Investment Offices	223	\$75,498	99.34% BLE \$78,381
3	Petroleum and Coal Products	147	\$72,224	99.20% UTU \$70,545
4	<u>RAILROAD TRANSPORTATION</u>	243	\$69,082	98.97% ATDA \$68,408
5	Telephone and Telegraph	825	\$63,592	98.19% RTA \$65,002
6	Tobacco Manufacturers	44	\$61,886	98.15%
7	Coal Mining	110	\$61,755	98.05%
8	Motor Vehicles and Equipment	829	\$58,653	97.26%
9	Chemicals and Allied Products	1,040	\$57,275	96.26%
10	<u>PIPELINES, EXCEPT NATURAL GAS</u>	19	\$57,211	96.24%
11	Legal Services	925	\$56,709	95.36%
12	Electric, Gas and Sanitary Services	929	\$56,413	94.68% BRS \$56,022
13	Oil and Gas Extraction	336	\$54,943	94.17%
14	Metal Mining	50	\$54,200	94.12%
15	Other Transportation Equipment	908	\$52,715	93.26%
16	Other Services	2,597	\$52,710	90.80% IBEW \$52,313
17	Federal Government	4,894	\$50,693	90.16% IAM \$52,075
18	Instruments and Related Products	878	\$50,031	89.53% SSW \$51,532
19	<u>TRANSPORTATION BY AIR</u>	681	\$49,673	88.69% TCU \$51,313
20	Primary Metal Industries	672	\$49,190	84.69% IBB \$50,531
21	Warehouse and Depots	445	\$48,043	84.05% BEC \$49,907
22	Industrial Machinery & Equipment	1,903	\$46,731	83.63% RWV \$48,721
23	Insurance Carriers	1,446	\$46,115	81.83%
24	Paper and Allied Products	684	\$45,442	80.46%
25	Electronic & other Electric Equipment	1,506	\$44,260	79.81%
26	<u>WATER TRANSPORTATION</u>	159	\$44,239	78.38%
27	Nonmetallic Minerals Ex. Fuels	101	\$42,594	78.23%
28	Wholesale Trade	5,800	\$42,152	78.14% IBPO \$43,275
29	Insurance Agents, Brokers & Service	644	\$40,664	72.65%
30	Radio and Television	332	\$40,636	72.02%
31	Motion Pictures	321	\$40,254	71.70%
32	Fabricated Metal Products	1,315	\$39,557	71.40%
33	Printing and Publishing	1,419	\$39,514	70.15%
34	Stone, Clay and Glass Products	511	\$39,160	68.81%
35	Depository Institutions	1,972	\$38,951	68.33%
36	Health Services	3,005	\$38,233	66.46%
37	State and Local Government	13,619	\$37,970	58.88%
38	Food and Kindred Products	1,609	\$36,569	45.98%
39	Rubber and Misc. Plastics Products	896	\$36,212	44.46%
40	Transportation Services	340	\$35,418	43.61%
41	Construction	4,523	\$35,247	43.29%
42	<u>TRUCKING & WAREHOUSING</u>	1,611	\$35,017	39.00%
43	Miscellaneous Manufacturing Industries	379	\$32,393	37.48%
44	Miscellaneous Repair Services	350	\$32,374	37.12%
45	Real Estate	1,286	\$31,071	36.79%
46	Furniture and Fixtures	472	\$30,025	35.57%
47	Lumber and Wood Products	707	\$29,635	35.12%
48	Business Services	5,346	\$28,507	34.45%
49	Textile Mill Products	666	\$28,020	29.39%
50	Amusement and Recreation Services	1,049	\$27,633	28.76%
51	Educational Services	1,615	\$27,237	27.76%
52	Leather and Leather Prods.	117	\$25,658	26.23%
53	Local and Interurban Pgr. Transit	366	\$24,795	26.12%
54	Auto Repair, Services, and Parking	947	\$24,794	25.80%
55	Hotels and Other Lodging Places	1,445	\$24,471	24.90%
56	Apparel and Other Textile Products	954	\$22,008	23.53%
57	Retail Trade	16,728	\$20,848	22.63%
58	Agri. Services, Forestry & Fisheries	859	\$20,694	6.79%
59	Social Services & Membership Orgns.	3,597	\$20,263	5.97%
60	Personal Services	1,070	\$20,150	2.57%
61	Farms	783	\$17,086	1.55%
62	Private Households	856	\$12,570	.81%
	All Domestic Industries	105,593	\$35,803	.00%

SOURCE: SURVEY OF CURRENT BUSINESS, U. S. Dept. of Commerce, July, 1994.
Railroad Unions from Wage Statistics, Class I Railroads.
BRLC Nov 4, 1994

DofCdata.comp93

**AVERAGE ANNUAL COMPENSATION FOR FULL-TIME EMPLOYEE
BY INDUSTRY, BASED UPON DATA FOR 1993
YEAR 1993**

<u>RANK</u>	<u>INDUSTRY</u>	<u>NO. OF EMPLOYEES (000)</u>	<u>AVERAGE ANNUAL COMPENSATION</u>	<u>PERCENT EMPLS. WITH LOWER COMP.</u>	
1	Security and Commodity Brokers	445	\$94,609	99.57%	
2	Holding and Other Investment Offices	285	\$74,089	99.38% BLE	\$76,128
3	Petroleum and Coal Products	194	\$68,422	99.23% UTU	\$71,552
4	<u>RAILROAD TRANSPORTATION</u>	248	\$64,282	98.99% ATDA	\$65,565
5	Tobacco Manufacturers	47	\$60,404	98.94% RYA	\$64,065
6	Telephone and Telegraph	891	\$59,418	98.14%	
7	Coal Mining	126	\$58,386	98.02%	
8	<u>PIPELINES, EXCEPT NATURAL GAS</u>	15	\$57,842	98.00%	
9	Legal Services	464	\$55,429	97.12%	
10	Chemicals and Allied Products	1,085	\$54,912	96.10%	
11	Electric, Gas and Sanitary Services	940	\$53,657	95.19%	BRS \$54,054
12	Motor Vehicles and Equipment	898	\$53,386	94.41%	
13	Oil and Gas Extraction	345	\$52,884	94.08% IAM	\$52,629
14	Metal Mining	33	\$50,792	94.03% IBEW	\$50,919
15	Other Transportation Equipment	1,871	\$50,461	93.05% SMW	\$50,198
16	<u>TRANSPORTATION BY AIR</u>	673	\$48,272	92.40% BRC	\$49,544
17	Federal Government	3,881	\$48,058	87.50% IBM	\$49,169
18	Instruments and Related Products	911	\$47,714	86.63% NAFU	\$47,802
19	Other Services	2,538	\$47,454	84.19%	
20	Primary Metal Industries	480	\$47,082	83.53%	
21	Industrial Machinery & Equipment	1,085	\$44,855	81.71%	
22	Paper and Allied Products	679	\$43,791	81.05%	
23	Insurance Carriers	1,435	\$43,225	79.65%	
24	Depository Institutions	394	\$43,188	79.27%	
25	<u>WATER TRANSPORTATION</u>	164	\$42,134	79.11% IBFO	\$42,784
26	Electronic & other Electric Equipment	1,587	\$41,758	77.66%	
27	Nonmetallic Minerals Ex. Fuels	181	\$40,783	77.54%	
28	Wholesale Trade	5,872	\$40,488	71.93%	
29	Insurance Agents, Brokers & Service	656	\$39,840	71.27%	
30	Radio and Television	327	\$38,780	70.95%	
31	Motion Pictures	291	\$38,227	70.67%	
32	Stone, Clay and Glass Products	588	\$38,048	70.19%	
33	Fabricated Metal Products	1,385	\$38,033	68.93%	
34	Printing and Publishing	1,489	\$37,914	67.57%	
35	Health Services	7,768	\$36,951	60.08%	
36	State and Local Government	13,434	\$36,495	47.13%	
37	Depository Institutions	2,003	\$36,125	45.20%	
38	Food and Kindred Products	1,591	\$35,383	43.67%	
39	Construction	4,344	\$35,005	39.46%	
40	Rubber and Plasti. Products	867	\$34,554	38.62%	
41	<u>TRUCKING & WAREHOUSING</u>	1,541	\$33,165	37.14%	
42	Transportation Services	326	\$33,853	36.82%	
43	Miscellaneous Manufacturing Industries	348	\$31,367	36.47%	
44	Miscellaneous Repair Services	335	\$31,275	36.14%	
45	Real Estate	1,280	\$29,853	34.93%	
46	Furniture and Fixtures	459	\$28,651	34.49%	
47	Lumber and Wood Products	676	\$28,484	33.83%	
48	Business Services	4,980	\$27,616	29.03%	
49	Textile Mill Products	688	\$26,995	28.40%	
50	Educational Services	1,309	\$26,487	26.90%	
51	Amusement and Recreation Services	994	\$26,332	25.94%	
52	Leather and Leather Products	119	\$24,430	25.82%	
53	Auto Repair, Services, and Parking	898	\$24,145	24.96%	
54	Local and Interurban Pass. Transit	332	\$23,949	24.64%	
55	Hotels and Other Lodging Places	1,430	\$23,382	23.26%	
56	Agri. Services, Forestry & Fisheries	818	\$21,540	22.47%	
57	Apparel and Other Textile Products	946	\$21,362	21.54%	
58	Retail Trade	16,294	\$20,332	5.83%	
59	Social Services & Membership Orgs.	3,458	\$19,432	2.49%	
60	Personal Services	1,043	\$19,584	1.49%	
61	Farms	739	\$16,138	.78%	
62	Private Households	885	\$12,605	.00%	
	All Domestic Industries	103,724	\$34,536		

SOURCE: SURVEY OF CURRENT BUSINESS, U. S. Dept. of Commerce, August, 1993.
 Railroad Unions from Wage Statistics, Class I Railroads.
WELC Oct 12, 1993

BofCdata.comp#2

**AVERAGE ANNUAL COMPENSATION PER FULL-TIME EMPLOYEE
BY INDUSTRY, RANGED FROM HIGH TO LOW
YEAR 1991**

RANK	INDUSTRY	NO. OF EMPLOYERS (000)	AVERAGE ANNUAL COMPENS.	PERCENT EMPLS. WITH LOWER COMP.	
1	Security and Commodity Brokers	425	\$79,249	99.42	BLE \$72,446
2	Holding and Other Investment Offices	257	\$66,080	99.42	UTU \$64,911
3	Petroleum and Coal Products	156	\$63,705	99.22	ATDA \$63,253
4	Tobacco Manufacturers	48	\$54,833	99.22	RYA \$62,473
5	<u>RAILROAD TRANSPORTATION</u>	256	\$54,781	98.98	
6	Coal Mining	133	\$35,677	98.82	
7	Telephone and Telegraph	858	\$35,024	98.02	
8	<u>PIPELINES, EXCEPT NATURAL GAS</u>	19	\$33,053	98.02	BRE \$54,364
9	Legal Services	903	\$32,553	97.12	
10	Chemicals and Allied Products	1,066	\$31,489	96.12	IBBW \$31,360
11	Motor Vehicles and Equipment	775	\$30,985	95.32	TCU \$30,533
12	Electric, Gas and Sanitary Services	944	\$30,334	94.42	SNM \$30,518
13	Oil and Gas Extraction	385	\$48,675	94.02	BBC \$49,928
14	Metal Mining	56	\$48,107	94.02	NOFU \$48,227
15	Other Transportation Equipment	1,091	\$47,293	92.92	IAN \$47,770
16	<u>TRANSPORTATION BY AIR</u>	678	\$46,239	92.32	
17	Instruments and Related Products	954	\$44,964	91.32	
18	Other Services	2,674	\$44,413	88.92	
19	Federal Government	5,266	\$44,057	85.92	
20	Primary Metal Industries	713	\$43,969	83.22	IBFEO \$43,228
21	Industrial Machinery & Equipment	1,976	\$42,282	81.32	
22	Paper and Allied Products	682	\$41,368	80.62	
23	Insurance Carriers	1,467	\$40,462	79.22	
24	<u>WATER TRANSPORTATION</u>	172	\$40,344	79.02	
25	Depository Institutions	367	\$39,433	78.72	
26	Electronic & other Electric Equipment	1,570	\$39,037	77.12	
27	Wholesale Trade	5,869	\$38,402	71.52	
28	Nonmetallic Minerals Ex. Fuels	104	\$38,337	71.42	
29	Insurance Agents, Brokers & Service	674	\$36,973	70.72	
30	Fabricated Metal Products	1,328	\$36,399	69.42	
31	Stone, Clay and Glass Products	913	\$36,014	68.92	
32	Radio and Television	328	\$35,848	68.42	
33	Printing and Publishing	1,443	\$35,615	67.22	
34	Health Services	7,380	\$35,469	60.12	
35	State and Local Government	13,368	\$34,967	47.22	
36	Motion Pictures	375	\$34,638	44.82	
37	Construction	4,515	\$33,906	42.52	
38	Food and Kindred Products	1,813	\$33,568	40.92	
39	Depository Institutions	2,070	\$33,333	38.92	
40	Rubber and Misc. Plastics Products	81	\$32,643	38.12	
41	<u>TRUCKING & WAREHOUSING</u>	1,531	\$32,599	36.62	
42	Transportation Services	323	\$32,108	36.32	
43	Miscellaneous Manufacturing Industries	366	\$29,962	35.92	
44	Miscellaneous Repair Services	331	\$29,807	35.62	
45	Real Estate	1,279	\$28,402	34.42	
46	Lumber and Wood Products	671	\$27,191	33.72	
47	Furniture and Fixtures	457	\$27,112	33.32	
48	Business Services	4,651	\$26,403	28.82	
49	Educational Services	1,538	\$25,640	27.32	
50	Textile Mill Products	653	\$25,579	26.72	
51	Amusement and Recreation Services	951	\$24,616	25.82	
52	Leather and Leather Goods	123	\$23,309	25.62	
53	Auto Repair, Services, and Parking	886	\$23,268	24.82	
54	Local and Interurban Pgr. Transit	325	\$23,046	24.32	
55	Hotels and Other Lodging Places	1,445	\$21,990	23.12	
56	Apparel and Other Textile Products	967	\$20,441	22.12	
57	Agri. Services, Forestry & Fisheries	815	\$19,832	21.32	
58	Retail Trade	16,170	\$19,686	9.72	
59	Personal Services	1,025	\$19,019	6.72	
60	Social Services & Membership Orgs.	3,346	\$18,923	1.52	
61	Farm	742	\$16,042	.82	
62	Private Households	809	\$11,352	.02	
	All Domestic Industries	103,426	\$32,787		

SOURCE: SURVEY OF CURRENT BUSINESS, U. S. Dept. of Commerce, July, 1992.
NALL Nov 30, 1992

DefDate.comp01

**AVERAGE ANNUAL COMPENSATION PER FULL-TIME EMPLOYEE
BY INDUSTRY, RANKED FROM HIGH TO LOW
YEAR 1990**

RANK	INDUSTRY	NO. OF EMPLOYEES (000)	AVERAGE ANNUAL COMPENS.	PERCENT EMPLS. WITH LOWER COMP.		
1	SECURITY & COMMODITY BROKERS	430	\$75,172	99.85	BLE	\$70,501
2	PETROLEUM & COAL PRODUCTS	154	\$69,987	99.48	UTU	\$63,817
3	HOLDING & OTHER INVESTMENT OFFICES	278	\$60,851	99.38	ATDA	\$61,304
4	RAILROAD TRANSPORTATION	278	\$55,076	99.05	RYA	\$60,089
5	COAL MINING	144	\$54,271	98.95		
6	TOBACCO MANUFACTURES	51	\$53,118	98.85		
7	TELEPHONE & TELEGRAPH	899	\$51,028	98.05	BRS	\$51,317
8	PIPELINES, EXCEPT NATURAL GAS	19	\$49,474	97.95		
9	LEGAL SERVICES	930	\$49,150	97.15		
10	MOTOR VEHICLES & EQUIPMENT	814	\$49,047	96.35		
11	CHEMICALS & ALLIED PRODUCTS	1,076	\$48,969	95.35	ZREV	\$48,308
12	ELECTRIC, GAS & SANITARY SERVICES	937	\$47,822	94.45	LAM	\$47,453
13	OIL & GAS EXTRACTION	387	\$46,297	94.05	SHW	\$47,387
14	METAL MINING	50	\$46,155	94.05	TCU	\$47,327
15	OTHER TRANSPORTATION EQUIPMENT	1,172	\$45,188	92.95	BRC	\$47,295
16	TRANSPORTATION BY AIR	685	\$43,994	92.25	IBB	\$46,538
17	PRIMARY METAL INDUSTRIES	748	\$43,338	91.55	DME	\$45,232
18	INSTRUMENTS & RELATED PRODUCTS	988	\$42,577	90.65		
19	OTHER SERVICES	2,906	\$41,423	88.15		
20	INDUSTRIAL MACHINERY & EQUIPMT.	2,081	\$40,821	86.25		
21	PAPER & ALLIED PRODUCTS	691	\$40,307	85.55		
22	FEDERAL GOVERNMENT	5,410	\$40,274	80.45	IBF40	\$40,169
23	WATER TRANSPORTATION	169	\$38,604	80.25		
24	NONMETALLIC MINERALS, EXCEPT FUELS	111	\$37,394	80.15		
25	NONDEPOSITORY INSTITUTIONS	386	\$37,352	79.85		
26	INSURANCE CARRIERS	1,462	\$37,185	78.45		
27	ELECTRONIC & OTHER ELEC. EQUIPMT.	1,658	\$37,054	78.85		
28	RADIO & TELEVISION	316	\$37,051	78.55		
29	WHOLESALE TRADE	6,029	\$36,857	70.25		
30	FABRICATED METAL PRODUCTS	1,464	\$34,744	69.55		
31	STONE, CLAY & GLASS PRODUCTS	551	\$34,657	69.05		
32	PRINTING & PUBLISHING	1,483	\$34,118	67.65		
33	MOTION PICTURES	322	\$34,096	67.35		
34	HEALTH SERVICES	7,124	\$33,570	60.55		
35	STATE AND LOCAL GOVERNMENT	12,209	\$33,371	48.15		
36	CONSTRUCTION	5,014	\$32,836	47.35		
37	FOOD & KINDRED PRODUCTS	1,602	\$31,953	41.85		
38	DEPOSITORY INSTITUTIONS	2,157	\$31,816	39.25		
39	INSURANCE BROKERS, AGENTS & SVC.	756	\$31,861	39.15		
40	RUBBER & MISCEL. PLASTICS PRODUCTS	672	\$31,458	38.25		
41	TRUCKING & WAREHOUSING	1,556	\$31,287	35.85		
42	REAL ESTATE	1,217	\$29,872	35.65		
43	TRANSPORTATION SERVICES	328	\$28,851	35.35		
44	MISCELLANEOUS REPAIR SERVICES	387	\$28,841	34.55		
45	MISCELLANEOUS MANUFACTURING IND.	375	\$28,592	34.65		
46	LUMBER & WOOD PRODUCTS	727	\$26,524	33.95		
47	FURNITURE & FIXTURES	495	\$25,343	33.45		
48	BUSINESS SERVICES	4,636	\$25,056	28.55		
49	TEXTILE MILL PRODUCTS	685	\$23,986	28.25		
50	EDUCATIONAL SERVICES	1,831	\$23,412	26.65		
51	AMUSEMENT & RECREATION SERVICES	954	\$23,210	25.55		
52	AUTO REPAIR, SVCS. & PARKING	967	\$21,910	24.55		
53	LEATHER & LEATHER PRODUCTS	134	\$21,903	24.65		
54	LOCAL & INTERURBAN PASSENGER TRNST.	323	\$21,198	24.55		
55	HOTELS & OTHER LODGING PLACES	1,588	\$20,487	22.15		
56	APPAREL & OTHER TEXTILE PRODUCTS	1,005	\$19,321	22.15		
57	RETAIL TRADE	16,872	\$18,462	8.45		
58	AGRI. SVCS., FORESTRY & FISHERIES	843	\$18,239	5.55		
59	PERSONAL SERVICES	1,089	\$17,730	4.65		
60	SOCIAL SVCS. & MEMBERSHIP ORGANIZ.	3,253	\$17,470	1.55		
61	FARMS	764	\$15,761	.85		
62	PRIVATE HOUSEHOLDS	822	\$11,647	.65		
	ALL DOMESTIC INDUSTRIES	105,803	\$31,101			

SOURCE: SURVEY OF CURRENT BUSINESS, U. S. Dept. of Commerce, January, 1992

NPLC 2/28/92

AVERAGE ANNUAL COMPENSATION FOR FULL-TIME EMPLOYEES,
BY INDUSTRY, RANKED FROM HIGH TO LOW
1989

Rank (1)	Industry (2)	No. of Employees (000) (3)	Average Annual Compensation (4)	Percent of Employees with Lower Comp. (5)
1.	Security-Commodity Brokers & Svc.	429	\$70,368	99.6%
2.	Petroleum & Coal Products	152	\$61,526	99.4%
3.	Holding & Other Investment Cos.	210	\$58,500	99.2%
4.	RAILROAD TRANSPORTATION	277	\$55,924	98.9%
5.	Tobacco Manufacturers	51	\$52,255	98.9%
6.	Telephone & Telegraph	932	\$49,004	98.0%
7.	Motor Vehicles & Equipment	843	\$48,989	97.1%
8.	Coal Mining	143	\$48,951	97.0%
9.	Pipelines Ex. Natural Gas	18	\$48,167	97.0%
10.	Elec. Gas & Sanitary Services	915	\$46,914	96.1%
11.	Chemicals & Allied Products	1,058	\$46,239	95.0%
12.	Metal Mining	56	\$45,993	95.0%
13.	Legal Services	916	\$45,742	94.1%
14.	Oil & Gas Extraction	365	\$44,236	93.7%
15.	Other Transportation Equipment	1,207	\$43,683	92.5%
16.	Transportation by Air	653	\$42,426	91.9%
17.	Primary Metal Products	782	\$42,344	91.2%
18.	Motion Pictures	198	\$39,702	91.0%
19.	Machinery Ex. Electrical	2,075	\$38,691	88.9%
20.	Misc. Professional Services	1,534	\$38,525	87.4%
21.	Paper & Allied Products	693	\$38,494	86.7%
22.	Instruments & Related Products	728	\$37,655	86.0%
23.	Federal Government	4,504	\$37,422	81.6%
24.	Water Transportation	167	\$37,048	81.4%
25.	Radio & Television Broadcasting	224	\$36,438	81.2%
26.	Electric & Electronic Equipment	2,027	\$36,380	79.2%
27.	Insurance Carriers	1,432	\$35,801	77.8%
28.	Nonmetallic Minerals Ex. Fuels	110	\$35,536	77.7%
29.	Wholesale Trade	6,050	\$34,673	71.7%
30.	Ins. Agents Brokers & Services	638	\$34,288	71.1%
31.	Fabricated Metal Products	1,420	\$33,389	69.7%
32.	Stone Clay & Glass Products	593	\$33,388	69.1%
33.	Construction	5,009	\$32,338	64.2%
34.	Banking	1,682	\$32,036	62.6%
35.	Printing & Publishing	1,473	\$31,843	61.1%
36.	State & Local Government	11,820	\$31,557	49.5%
37.	Health Services	6,717	\$30,714	42.9%
38.	Food & Kindred Products	1,581	\$30,594	41.3%
39.	Trucking & Warehousing	1,543	\$30,224	39.8%
40.	Credit Agencies Other than Banks	860	\$29,916	39.0%
41.	Rubber & Misc. Plastics	838	\$29,839	38.2%
42.	Transportation Services	314	\$28,920	37.8%
43.	Real Estate	1,271	\$28,121	36.8%
44.	Misc. Repair Services	381	\$27,474	36.2%
45.	Miscellaneous Manufacturing Inds.	382	\$26,631	35.9%
46.	Business Services	5,525	\$26,282	30.4%
47.	Lumber & Wood Products	730	\$25,579	29.7%
48.	Furniture & Fixtures	510	\$24,302	29.2%
49.	Textile Mill Products	705	\$23,199	28.5%
50.	Educational Services	1,485	\$22,270	27.1%
51.	Amusement & Recreation Services	811	\$22,117	26.3%
52.	Auto Repair Services & Garages	899	\$21,335	25.4%
53.	Local & Interurban Psgr. Transit	317	\$20,751	25.1%
54.	Leather & Leather Prods.	138	\$20,232	24.9%
55.	Hotels & Other Lodging Places	1,460	\$19,046	23.6%
56.	Apparel & Other Textile Prods.	1,043	\$18,164	22.5%
57.	Social Services Membership Orgns.	2,997	\$18,116	19.5%
58.	Retail Trade	16,428	\$17,859	3.4%
59.	Personal Services	1,125	\$17,021	2.3%
60.	Agri. Svcs. Forestry & Fisheries	802	\$16,955	1.5%
61.	Private Households	687	\$14,921	0.8%
62.	Farms	806	\$12,697	0.0%
	All Domestic Industries	103,470	\$29,758	-

SOURCE: SURVEY OF CURRENT BUSINESS, U. S. Department of Commerce, July 1990, pp 79-80.

NRLC 08-27-1990

M

AVERAGE ANNUAL COMPENSATION PER FULL-TIME EMPLOYEE,
BY INDUSTRY, RANKED FROM HIGH TO LOW
1969

Rank (1)	Industry (2)	No. of Employees (000) (3)	Average Annual Compensation (4)	Percent of Employees with Lower Comp. (5)
1.	Security-Commodity Brokers & Exch.	441	\$73,764	99.0%
2.	Petroleum & Coal Products	150	\$60,380	99.4%
3.	RAILROAD TRANSPORTATION	279	\$53,688	99.7%
4.	Holding & Other Investment Cos.	211	\$53,611	98.9%
5.	Tobacco Manufacturers	54	\$48,881	98.8%
6.	Motor Vehicles & Equipment	841	\$48,158	98.0%
7.	Pipelines Ex. Natural Gas	10	\$48,055	98.0%
8.	Coal Mining	148	\$47,372	97.8%
9.	Telephones & Telegraph	900	\$47,210	96.9%
10.	Elec. Gas & Sanitary Services	918	\$44,886	95.8%
11.	Metal Mining	90	\$44,380	95.9%
12.	Chemicals & Allied Products	1,048	\$44,348	94.8%
13.	Legal Services	875	\$44,137	94.8%
14.	Oil & Gas Extraction	395	\$42,298	93.6%
15.	Other Transportation Equipment	1,194	\$42,049	92.4%
16.	Transportation by Air	808	\$41,717	91.7%
17.	Primary Metal Products	763	\$40,808	91.0%
18.	Motion Pictures	192	\$37,989	90.6%
19.	Paper & Allied Products	682	\$37,412	90.1%
20.	Machinery Ex. Electrical	2,047	\$37,381	88.0%
21.	Misc. Professional Services	1,444	\$36,795	86.6%
22.	Instruments & Related Products	723	\$36,547	85.9%
23.	Radio & Television Broadcasting	217	\$35,889	85.6%
24.	Federal Government	4,482	\$35,468	91.1%
25.	Water Transportation	166	\$35,157	80.9%
26.	Electric & Electronic Equipment	2,080	\$35,047	78.9%
27.	Nonmetallic Minerals Ex. Fuels	112	\$34,583	78.6%
28.	Insurance Carriers	1,424	\$34,137	77.3%
29.	Wholesale Trade	5,822	\$33,721	71.5%
30.	Ins. Agents Brokers & Services	628	\$33,289	70.8%
31.	Stone Clay & Glass Products	590	\$32,846	70.2%
32.	Fabricated Metal Products	1,682	\$32,451	68.8%
33.	Construction	4,940	\$31,390	63.8%
34.	Printing & Publishing	1,453	\$31,275	62.4%
35.	Banking	1,645	\$31,127	60.7%
36.	State & Local Government	11,512	\$30,098	49.1%
37.	Health Services	9,425	\$29,822	42.6%
38.	Trucking & Warehousing	1,508	\$29,508	41.1%
39.	Rubber & Misc. Plastics	817	\$29,001	40.3%
40.	Food & Kindred Products	1,873	\$28,594	38.7%
41.	Credit Agencies Other than Banks	896	\$28,279	37.8%
42.	Transportation Services	298	\$27,708	37.5%
43.	Real Estate	1,272	\$27,091	36.3%
44.	Misc. Repair Services	341	\$26,240	35.9%
45.	Miscellaneous Manufacturing Inds.	285	\$25,881	35.5%
46.	Business Services	5,147	\$25,200	30.3%
47.	Lumber & Wood Products	744	\$25,137	29.6%
48.	Furniture & Fixtures	512	\$23,584	29.1%
49.	Amusement & Recreation Services	744	\$22,376	28.3%
50.	Textile Mill Products	714	\$22,218	27.6%
51.	Educational Services	1,482	\$21,125	26.1%
52.	Auto Repair Services & Garages	854	\$20,748	25.3%
53.	Local & Interurban Pgr. Transit	302	\$20,321	24.8%
54.	Leather & Leather Prods.	142	\$19,465	24.8%
55.	Hotels & Other Lodging Places	1,392	\$18,379	23.4%
56.	Apparel & Other Textile Prods.	1,055	\$17,508	22.3%
57.	Social Services Membership Orgns.	2,780	\$17,478	19.5%
58.	Retail Trade	15,915	\$17,474	3.5%
59.	Agri. Svcs. Forestry & Fisheries	772	\$16,705	2.7%
60.	Personal Services	1,103	\$16,164	1.8%
61.	Private Households	725	\$12,918	0.9%
62.	Farms	873	\$11,525	0.8%
	All Domestic Industries	100,995	\$28,790	-

SOURCE: SURVEY OF CURRENT BUSINESS, U. S. Department of Commerce, July 1969, pp 79-80.

NRLC 10-10-1989

VII
M

AVERAGE ANNUAL COMPENSATION PER FULL-TIME EMPLOYEE,
BY INDUSTRY, RANKED FROM HIGH TO LOW
1967

Rank (1)	Industry (2)	No. of Employees (000) (3)	Average Annual Compensation (4)	Percent of Employees with Lower Comp. (5)
1.	Security-Commodity Brokers & Svc.	443	\$70,312	99.55
2.	Petroleum & Coal Products	160	\$57,144	99.45
3.	RAILROAD TRANSPORTATION	294	\$49,558	99.15
4.	Tobacco Manufacturers	57	\$46,396	99.05
5.	Holding & Other Investment Cos.	203	\$46,376	98.85
6.	Coal Mining	157	\$45,904	98.85
7.	Telephone & Telegraph	965	\$45,758	97.65
8.	Motor Vehicles & Equipment	847	\$44,893	96.85
9.	Pipelines Ex. Natural Gas	18	\$44,889	96.75
10.	Elec. Gas & Sanitary Services	901	\$42,992	95.85
11.	Chemicals & Allied Products	1,007	\$41,821	94.85
12.	Metal Mining	44	\$41,659	94.75
13.	Legal Services	831	\$40,781	93.85
14.	Other Transportation Equipment	1,182	\$40,733	92.85
15.	Oil & Gas Extraction	385	\$40,701	92.25
16.	Transportation by Air	570	\$40,560	91.85
17.	Primary Metal Products	724	\$38,778	90.85
18.	Motion Pictures	185	\$38,681	90.75
19.	Machinery Ex. Electrical	1,982	\$35,584	88.85
20.	Paper & Allied Products	674	\$35,547	87.85
21.	Misc. Professional Services	1,371	\$34,792	86.55
22.	Instruments & Related Products	582	\$34,468	85.85
23.	Radio & Television Broadcasting	218	\$34,018	85.85
24.	Federal Government	4,472	\$33,765	81.85
25.	Water Transportation	170	\$33,653	80.85
26.	Electric & Electronic Equipment	2,055	\$33,303	78.75
27.	Nonmetallic Minerals Ex. Fuels	108	\$33,185	78.55
28.	Insurance Carriers	1,378	\$32,047	77.15
29.	Stone Clay & Glass Products	577	\$31,458	76.55
30.	Wholesale Trade	5,686	\$31,364	70.65
31.	Fabricated Metal Products	1,375	\$30,950	69.25
32.	Ins. Agents Brokers & Services	565	\$30,924	68.85
33.	Construction	4,778	\$29,755	63.85
34.	Printing & Publishing	1,400	\$29,434	62.25
35.	Banking	1,655	\$28,634	60.55
36.	Food & Kindred Products	1,560	\$28,533	58.85
37.	State & Local Government	11,284	\$28,485	47.15
38.	Trucking & Warehousing	1,429	\$28,461	45.85
39.	Rubber & Misc. Plastics	809	\$27,707	44.85
40.	Health Services	6,301	\$27,642	38.35
41.	Credit Agencies Other than Banks	862	\$27,609	37.45
42.	Transportation Services	283	\$26,124	37.15
43.	Real Estate	1,216	\$25,211	36.85
44.	Misc. Repair Services	312	\$25,074	35.85
45.	Miscellaneous Manufacturing Inds.	387	\$24,616	35.15
46.	Business Services	4,770	\$24,127	30.25
47.	Lumber & Wood Products	732	\$23,633	29.45
48.	Furniture & Fixtures	503	\$22,509	28.85
49.	Textile Mill Products	713	\$21,442	28.25
50.	Amusement & Recreation Services	733	\$20,321	27.45
51.	Auto Repair Services & Garages	818	\$19,840	26.85
52.	Local & Interurban Psgr. Transit	288	\$19,427	26.35
53.	Educational Services	1,434	\$19,382	24.85
54.	Leather & Leather Prods.	141	\$18,489	24.85
55.	Hotels & Other Lodging Places	1,320	\$17,416	23.35
56.	Retail Trade	15,400	\$16,764	7.35
57.	Social Services Membership Orgns.	2,615	\$16,668	4.85
58.	Apparel & Other Textile Prods.	1,061	\$16,595	3.55
59.	Agri. Svcs. Forestry & Fisheries	700	\$16,360	2.75
60.	Personal Services	1,051	\$15,456	1.75
61.	Private Households	740	\$12,437	0.85
62.	Farms	858	\$11,498	0.85
	All Domestic Industries	98,167	\$27,334	-

SOURCE: SURVEY OF CURRENT BUSINESS, U. S. DEPARTMENT OF COMMERCE, July 1968, pp 80-81.

NRLC 10-07-1968

AVERAGE ANNUAL COMPENSATION PER FULL-TIME EMPLOYEE.
BY INDUSTRY, RANKED FROM HIGH TO LOW
1966

Rank (1)	Industry (2)	No. of Employees (000) (3)	Average Annual Compensation (4)	Percent of Employees with Lower Comp. (5)
1.	Security-Commodity Brokers & Svc.	352	\$68,472	99.6%
2.	Petroleum & Coal Products	174	\$56,688	99.4%
3.	RAILROAD TRANSPORTATION	342	\$48,379	99.1%
4.	Holding & Other Investment Cos.	163	\$43,158	98.9%
5.	Coal Mining	186	\$43,829	98.7%
6.	Motor Vehicles & Equipment	872	\$44,618	97.7%
7.	Pipelines, Ex. Natural Gas	19	\$44,888	97.7%
8.	Telephone & Telegraph	999	\$43,968	96.6%
9.	Tobacco Manufacturers	61	\$42,232	96.6%
10.	Elec., Gas & Sanitary Services	889	\$41,613	95.6%
11.	Metal Mining	45	\$41,122	95.3%
12.	Oil & Gas Extraction	264	\$48,727	94.9%
13.	Transportation by Air	498	\$48,418	94.4%
14.	Chemicals & Allied Products	1,832	\$46,874	93.3%
15.	Other Transportation Equipment	1,893	\$39,327	92.1%
16.	Primary Metal Products	796	\$38,892	91.2%
17.	Legal Services	710	\$36,773	90.4%
18.	Paper & Allied Products	667	\$34,565	89.7%
19.	Machinery, Ex. Electrical	2,152	\$34,256	87.4%
20.	Water Transportation	176	\$33,822	87.2%
21.	Instruments & Related Products	708	\$33,467	86.4%
22.	Motion Pictures	177	\$33,196	86.2%
23.	Misc. Professional Services	1,846	\$33,175	84.9%
24.	Radio & Television Broadcasting	218	\$33,168	84.6%
25.	Federal Government	4,438	\$32,485	79.8%
26.	Electric & Electronic Equipment	2,167	\$31,939	77.5%
27.	Nonmetallic Minerals, Ex. Fuels	188	\$31,687	77.3%
28.	Stone, Clay & Glass Products	576	\$30,884	76.7%
29.	Fabricated Metal Products	1,438	\$30,481	75.1%
30.	Wholesale Trade	3,497	\$30,125	65.2%
31.	Insurance Carriers	1,276	\$29,979	67.8%
32.	Ins. Agents, Brokers & Services	542	\$28,827	67.2%
33.	Construction	4,518	\$28,499	62.5%
34.	Printing & Publishing	1,328	\$28,364	60.8%
35.	Food & Kindred Products	1,528	\$27,911	59.2%
36.	Trucking & Warehousing	1,323	\$27,577	57.7%
37.	State & Local Government	18,685	\$27,846	46.1%
38.	Banking	1,623	\$27,152	44.6%
39.	Rubber & Misc. Plastics	774	\$26,853	43.3%
40.	Credit Agencies Other than Banks	726	\$26,368	42.7%
41.	Health Services	2,816	\$25,271	36.4%
42.	Transportation Services	261	\$25,096	36.1%
43.	Misc. Repair Services	312	\$24,829	35.8%
44.	Miscellaneous Manufacturing Inds.	359	\$23,823	35.4%
45.	Real Estate	1,118	\$23,798	34.2%
46.	Lumber & Wood Products	678	\$23,383	33.4%
47.	Business Services	4,826	\$23,185	29.1%
48.	Furniture & Fixtures	476	\$21,756	28.5%
49.	Textile Mill Products	678	\$20,565	27.8%
50.	Amusement & Recreation Services	692	\$19,139	27.8%
51.	Auto Repair, Services & Garages	748	\$19,856	26.2%
52.	Local & Interurban Pgr. Transit	268	\$18,725	25.9%
53.	Educational Services	1,353	\$18,183	24.5%
54.	Leather & Leather Prods.	163	\$17,694	24.3%
55.	Hotels & Other Lodging Places	1,216	\$16,683	23.6%
56.	Apparel & Other Textile Prods.	1,865	\$16,212	21.8%
57.	Retail Trade	14,845	\$16,183	6.1%
58.	Agri. Excs., Forestry & Fisheries	588	\$15,875	5.2%
59.	Social Services Membership Orgns.	2,428	\$15,679	2.8%
60.	Personal Services	978	\$15,842	1.8%
61.	Private Households	788	\$12,416	1.8%
62.	Farms	875	\$11,344	0.6%
	All Domestic Industries	92,628	\$26,295	—

SOURCE: SURVEY OF CURRENT BUSINESS, U. S. Department of Commerce, July 1967, pp 59-60.

NRLC 88/21/87

PERCENT OF EMPLOYMENT BY FULL-TIME EMPLOYEES
BY INDUSTRY, BASED UPON 1935
1935

Rank (1)	Industry (2)	No. of Employees (3)	Average Annual Compensation (4)	Percent of Employees with Lower Comp. (5)
1.	Petroleum & Coal Products	175	\$25,653	98.85
2.	Security-Commodity Brokers & Sec.	289	\$25,711	98.45
3.	RAILROAD TRANSPORTATION	245	\$46,032	98.15
4.	Motor Vehicles & Equipment	854	\$43,554	98.15
5.	Coal Mining	184	\$42,885	97.95
6.	Holding & Other Investment Cos.	151	\$42,521	97.75
7.	Telephone & Telegraph	997	\$42,125	96.75
8.	Pipelines, Ex. Natural Gas	19	\$42,105	96.45
9.	Retail Stores	45	\$41,539	96.45
10.	Transportation by Air	467	\$39,653	96.15
11.	Clng., Gas & Sanitary Services	887	\$38,942	95.15
12.	Telephone Manufacturing	62	\$38,885	95.05
13.	Oil & Gas Extraction	558	\$38,532	94.45
14.	Other Transportation Equipment	1,085	\$38,287	93.25
15.	Chemicals & Allied Products	1,042	\$38,032	92.15
16.	Primary Metal Products	883	\$37,776	91.25
17.	Legal Services	785	\$37,449	90.35
18.	Water Transportation	177	\$37,335	90.35
19.	Paper & Allied Products	571	\$37,115	89.35
20.	Machinery, Ex. Electrical	2,174	\$37,381	87.25
21.	Mech. Professional Services	1,247	\$37,389	85.85
22.	Radio & Television Broadcasting	218	\$37,784	85.65
23.	Federal Government	4,445	\$37,039	85.65
24.	Motion Pictures	175	\$37,384	85.65
25.	Instruments & Related Products	789	\$37,139	79.65
26.	Nonmetallic Minerals, Ex. Fuels	108	\$36,639	79.75
27.	Electric & Electronic Equipment	2,183	\$36,485	77.35
28.	Stone, Clay & Glass Products	575	\$36,987	76.75
29.	Fabricated Metal Products	1,435	\$36,323	75.15
30.	Wholesale Trade	5,385	\$36,574	69.15
31.	Express Carriers	1,388	\$36,084	67.75
32.	Construction	4,711	\$27,554	62.65
33.	Printing & Publishing	1,338	\$27,189	61.45
34.	Trucking & Warehousing	1,323	\$27,094	59.95
35.	Food & Kindred Products	1,548	\$26,032	59.35
36.	Ins. Agents, Brokers & Services	541	\$25,487	57.75
37.	State & Local Government	18,685	\$25,213	46.15
38.	Rubber & Plastics	778	\$25,045	45.25
39.	Banking	1,622	\$25,389	43.55
40.	Transportation Services	882	\$24,431	43.25
41.	Health Services	5,818	\$24,235	38.95
42.	Credit Agencies Other than Banks	725	\$24,188	36.15
43.	Mech. Repair Services	311	\$23,825	31.75
44.	Mechanical Manufacturing Inds.	339	\$23,639	31.35
45.	Lumber & Wood Products	576	\$22,441	30.65
46.	Business Services	4,827	\$22,383	29.25
47.	Real Estate	1,128	\$22,199	29.05
48.	Furniture & Fixtures	477	\$22,104	28.55
49.	Textile Mill Products	688	\$21,272	27.85
50.	Auto Repair, Services & Supplies	749	\$21,277	26.95
51.	Local & International Pay. Transit	858	\$21,289	26.65
52.	Equipment & Maintenance Services	691	\$21,089	25.95
53.	Educational Services	1,317	\$21,095	24.55
54.	Leather & Leather Goods	153	\$21,002	24.35
55.	Hotels & Other Lodging Places	1,292	\$21,087	23.85
56.	Agri. Secs., Forestry & Fisheries	389	\$21,611	22.35
57.	Rental & Other Trade Goods	1,057	\$21,399	21.25
58.	Retail Trade	14,431	\$21,516	19.95
59.	Retail Services Membership Orgs.	2,413	\$21,384	2.95
60.	Personal Services	979	\$21,452	1.85
61.	Private Households	788	\$21,384	1.85
62.	Farms	675	\$21,313	0.85
	63. Domestic Industries	52,653	\$25,887	-

SOURCE: SURVEY OF CURRENT BUSINESS, U. S. Department of Commerce, July 1936, Vol. 56, pp. 63-66.

AVERAGE ANNUAL COMPENSATION PER FULL-TIME EMPLOYEE,
BY INDUSTRY, RANKED FROM HIGH TO LOW
1984

Rank (1)	Industry (2)	No. of Employees (3)	Average Annual Compensation (4)	Percent of Employees with Lower Comp. (5)
1.	Petroleum & Coal Products	183	\$54,484	99.8%
2.	Security-Commodity Brokers & Svc.	337	\$51,819	99.4%
3.	RAILROAD TRANSPORTATION	365	\$44,439	99.0%
4.	Coal Mining	195	\$42,685	98.8%
5.	Motor Vehicles & Equipment	847	\$41,749	97.8%
6.	Pipelines, Ex. Natural Gas	19	\$40,632	97.8%
7.	Holding & Other Investment Cos.	147	\$40,456	97.7%
8.	Telephone & Telegram	1,838	\$40,228	96.5%
9.	Metal Mining	55	\$38,782	96.4%
10.	Transportation by Air	461	\$38,729	95.9%
11.	Elec., Gas & Sanitary Services	873	\$37,935	95.0%
12.	Tobacco Manufacturers	62	\$37,888	94.9%
13.	Oil & Gas Extraction	594	\$36,759	94.2%
14.	Other Transportation Equipment	1,848	\$36,658	93.1%
15.	Chemicals & Allied Products	1,836	\$36,413	91.9%
16.	Primary Metal Products	846	\$36,228	91.0%
17.	Legal Services	557	\$32,563	90.2%
18.	Water Transportation	183	\$32,284	90.0%
19.	Paper & Allied Products	667	\$31,963	89.1%
20.	Machinery, Ex. Electrical	2,169	\$31,589	86.9%
21.	Misc. Professional Services	1,167	\$30,981	85.6%
22.	Federal Government	4,396	\$30,847	85.6%
23.	Instruments & Related Products	788	\$29,796	79.9%
24.	Radio & Television Broadcasting	214	\$29,726	79.6%
25.	Nonmetallic Minerals, Ex. Fuels	187	\$29,578	79.5%
26.	Motion Pictures	172	\$29,535	79.3%
27.	Electric & Electronic Equipment	2,174	\$28,985	76.9%
28.	Stone, Clay & Glass Products	584	\$28,678	76.2%
29.	Fabricated Metal Products	1,426	\$28,285	74.6%
30.	Wholesale Trade	5,378	\$27,741	68.6%
31.	Insurance Carriers	1,254	\$27,867	67.2%
32.	Construction	4,249	\$26,936	66.3%
33.	Trucking & Warehousing	1,279	\$26,881	61.8%
34.	Printing & Publishing	1,264	\$26,328	59.6%
35.	Food & Kindred Products	1,536	\$26,898	57.9%
36.	Rubber & Misc. Plastics	765	\$25,563	57.1%
37.	Ins. Agents, Brokers & Services	518	\$24,937	56.5%
38.	State & Local Government	18,456	\$24,827	44.8%
39.	Banking	1,599	\$24,435	43.8%
40.	Transportation Services	842	\$23,826	42.8%
41.	Health Services	5,633	\$23,282	36.5%
42.	Credit Agencies Other than Banks	677	\$22,647	33.7%
43.	Misc. Repair Services	384	\$22,247	33.4%
44.	Miscellaneous Manufacturing Inds.	376	\$21,894	34.9%
45.	Lumber & Wood Products	698	\$21,718	34.2%
46.	Business Services	3,693	\$21,133	38.0%
47.	Real Estate	1,888	\$21,188	28.8%
48.	Furniture & Fixtures	473	\$20,872	28.3%
49.	Textile Mill Products	723	\$18,941	27.5%
50.	Auto Repair, Services & Garages	697	\$17,826	26.7%
51.	Local & Interurban Pass. Transit	261	\$17,644	26.4%
52.	Amusement & Recreation Services	684	\$17,516	25.7%
53.	Leather & Leather Prods.	182	\$16,888	25.5%
54.	Educational Services	1,251	\$16,448	24.1%
55.	Hotels & Other Lodging Places	1,154	\$15,355	22.8%
56.	Retail Trade	13,726	\$15,289	7.4%
57.	Agr. Svcs., Forestry & Fisheries	543	\$15,197	6.8%
58.	Apparel & Other Textile Prods.	1,136	\$15,188	5.6%
59.	Social Services Membership Orgns.	2,357	\$14,932	2.9%
60.	Personal Services	925	\$14,131	1.9%
61.	Private Households	779	\$11,172	1.0%
62.	Farms	923	\$10,958	0.8%
	All Domestic Industries	91,115	\$24,380	--

SOURCE: Unpublished data, Department of Commerce.

NRLC 84/87/86

AVERAGE ANNUAL COMPENSATION PER EMPLOYEE
BY INDUSTRY, RANGED FROM HIGH TO LOW
1983

M

Rank (1)	Industry (2)	No. of Employees (3)	Average Annual Compensation (4)	Percent of Employees with Lower Comp. (5)
1.	Security Commodity Brokers & Svc.	294	\$54,334	99.7%
2.	Petroleum & Coal Products	198	\$52,163	99.6%
3.	Railroad Transportation	364	\$41,318	99.6%
4.	Coal Mining	187	\$39,722	98.8%
5.	Transportation by Air	489	\$38,851	98.3%
6.	Telephones & Telegraph	1,894	\$38,496	97.6%
7.	Pipelines, Ex. Natural Gas	21	\$38,381	97.6%
8.	Motor Vehicles & Equipment	738	\$38,293	96.1%
9.	Metal Mining	56	\$37,768	96.0%
10.	Holding & Other Investment Cos.	125	\$37,624	95.9%
11.	Tobacco Manufacturers	64	\$37,469	95.8%
12.	Elec., Gas & Sanitary Svcs.	842	\$36,398	94.8%
13.	Oil & Gas Extraction	571	\$35,783	94.2%
14.	Other Transportation Equipment	988	\$35,359	93.8%
15.	Primary Metal Products	813	\$34,498	92.1%
16.	Chemicals & Allied Products	1,634	\$34,473	92.0%
17.	Water Transportation	174	\$31,736	92.6%
18.	Legal Services	338	\$31,888	92.0%
19.	Paper & Allied Products	649	\$30,388	89.2%
20.	Machinery, Ex. Electrical	1,986	\$30,056	86.9%
21.	Misc. Professional Services	1,815	\$29,716	85.7%
22.	Instruments & Related Products	682	\$28,792	84.9%
23.	Radio & Television	882	\$28,463	84.7%
24.	Electric & Electronic Equipment	1,988	\$27,897	82.4%
25.	Stone, Clay & Glass Products	332	\$27,382	81.7%
26.	Motion Pictures	164	\$27,338	81.9%
27.	Nonmetallic Minerals, Ex. Fuels	183	\$27,078	81.4%
28.	Wholesale Trade	3,635	\$26,266	73.3%
29.	Fabricated Metal Products	1,383	\$26,262	73.9%
30.	Trucking & Warehousing	1,165	\$26,282	72.8%
31.	Federal Government	3,161	\$25,725	66.3%
32.	Insurance Carriers	1,227	\$25,724	63.8%
33.	Construction	3,657	\$25,614	68.7%
34.	Printing & Publishing	1,177	\$25,297	59.3%
35.	Food & Kindred Products	1,529	\$25,193	57.6%
36.	Rubber & Misc. Plastics	692	\$24,386	55.7%
37.	Ins. Agents, Brokers & Services	473	\$23,729	56.2%
38.	State & Local Government	11,812	\$23,389	43.3%
39.	Banking	1,394	\$23,136	41.4%
40.	Health Services	5,388	\$22,647	33.1%
41.	Transportation Services	217	\$22,327	34.8%
42.	Miscellaneous Manufacturing Inds.	351	\$21,995	34.4%
43.	Credit Agencies Other than Banks	613	\$21,589	33.7%
44.	Misc. Repair Services	868	\$21,488	33.4%
45.	Lumber & Wood Products	623	\$21,262	32.7%
46.	Business Services	3,181	\$20,348	28.9%
47.	Real Estate	971	\$19,491	27.8%
48.	Furniture & Fixtures	448	\$18,864	27.3%
49.	Textile Mill Products	718	\$18,448	26.4%
50.	Auto Repair, Services & Garages	569	\$17,498	25.8%
51.	Local & Interurban Publ. Transit	242	\$17,339	25.3%
52.	Educational Services	1,142	\$16,878	24.2%
53.	Amusement & Recreation Services	648	\$16,688	23.4%
54.	Leather & Leather Prod.	194	\$16,898	23.2%
55.	Retail Trade	12,478	\$14,893	6.6%
56.	Social Services Membership Orgs.	2,125	\$14,827	6.1%
57.	Hotels & Other Lodging Places	1,844	\$14,686	4.8%
58.	Agri. Svcs., Forestry & Fisheries	426	\$14,578	4.3%
59.	Apparel & Other Textile Prods.	1,892	\$14,333	3.1%
60.	Personal Services	887	\$13,761	2.1%
61.	Farms	1,872	\$11,733	0.9%
62.	Private Households	735	\$10,569	0.8%
	All Domestic Industries	85,241	\$23,287	—

SOURCE: Survey of Current Business, July 1984, Department of Commerce.

NRLC 9/12/84

**AVERAGE ANNUAL COMPENSATION PER FULL-TIME EMPLOYEE,
BY INDUSTRY, RANKED FROM HIGH TO LOW**

1982

RANK (1)	INDUSTRY (2)	NO. OF EMPLOYEES (3)	AVERAGE ANNUAL COMPENSATION (4)	PERCENT OF EMPLOYEES WITH LOWER COMP. (5)
1.	PETROLEUM & COAL PRODUCTS	123	\$59,816	89.83
2.	SECURITY COMMODITY BROKERS & SERVICES	289	\$57,474	89.83
3.	COAL MINING	413	\$57,136	88.73
4.	TRANSPORTATION BY AIR	419	\$56,136	97.52
5.	MOTOR VEHICLES & EQUIPMENT	698	\$56,944	97.52
6.	RAILROAD TRANSPORTATION	611	\$55,820	97.45
7.	PIPELINES, EXCEPT NATURAL GAS	21	\$55,104	97.45
8.	DEEP MINING	73	\$54,521	97.45
9.	TELEPHONE & TELEGRAPH	1,138	\$54,521	97.45
10.	HOLDING & OTHER INVESTMENT COMPANIES	124	\$54,521	97.45
11.	OIL & GAS EXTRACTION	675	\$53,573	97.45
12.	REPAIR & MAINT. SERVICES	222	\$53,514	97.45
13.	ELECTRIC, GAS & SANITARY SERVICES	1,220	\$53,514	97.45
14.	OTHER TRANSPORTATION EQUIPMENT	66	\$53,514	97.45
15.	TOBACCO MANUFACTURES	66	\$53,514	97.45
16.	CHEMICALS & ALLIED PRODUCTS	1,068	\$53,436	98.24
17.	WATER TRANSPORTATION	187	\$53,436	98.24
18.	LEGAL SERVICES	217	\$53,436	98.24
19.	MACHINERY, EXCEPT ELECTRICAL	2,258	\$53,436	98.24
20.	FARM & ALLIED PRODUCTS	658	\$53,436	98.24
21.	FINANCIAL, PROFESSIONAL SERVICES	891	\$53,436	98.24
22.	INSTRUMENTS & RELATED PRODUCTS	126	\$53,436	98.24
23.	NONMETALLIC MINERALS, EXCEPT FUELS	784	\$53,436	98.24
24.	STONE, CLAY & GLASS PRODUCTS	186	\$53,436	98.24
25.	FABRICATED METAL PRODUCTS	1,368	\$53,436	98.24
26.	MOTION PICTURES	161	\$53,436	98.24
27.	TRUCKING & WAREHOUSING	1,471	\$53,436	98.24
28.	ELECTRIC & ELECTRONIC EQUIPMENT	1,471	\$53,436	98.24
29.	CONSTRUCTION	3,698	\$53,436	98.24
30.	WHOLESALE TRADE	5,879	\$53,436	98.24
31.	FEDERAL GOVERNMENT	5,133	\$53,436	98.24
32.	FOOD & KINDRED PRODUCTS	1,263	\$53,436	98.24
33.	INSURANCE CARRIERS	1,242	\$53,436	98.24
34.	PRINTING & PUBLISHING	1,149	\$53,436	98.24
35.	GUMBER & MISCL. PLASTIC PRODUCTS	676	\$53,436	98.24
36.	INSURANCE AGENTS, BROKERS & SERVICES	459	\$53,436	98.24
37.	STATE & LOCAL GOVERNMENT	11,849	\$53,436	98.24
38.	TRANSPORTATION SERVICES	1,287	\$53,436	98.24
39.	MINING	1,582	\$53,436	98.24
40.	HEALTH SERVICES	5,215	\$53,436	98.24
41.	HAIR, NAIL & BEAUTY SERVICES	234	\$53,436	98.24
42.	WOMEN'S & WOOD PRODUCTS	234	\$53,436	98.24
43.	MISCL. MANUFACTURING INDUSTRIES	565	\$53,436	98.24
44.	CREDIT AGENCIES OTHER THAN BANKS	561	\$53,436	98.24
45.	BUSINESS SERVICES	2,948	\$53,436	98.24
46.	FURNITURE & FIXTURES	413	\$53,436	98.24
47.	REAL ESTATE	938	\$53,436	98.24
48.	LOCAL & INTERURBAN PASSENGER TRANSIT	249	\$53,436	98.24
49.	AUTO REPAIR SERVICES & CARRIERS	344	\$53,436	98.24
50.	TEXTILE MILL PRODUCTS	715	\$53,436	98.24
51.	RECREATION & AMUSEMENT SERVICES	625	\$53,436	98.24
52.	INDUSTRIAL SERVICES	1,144	\$53,436	98.24
53.	LEATHER & LEATHER PRODUCTS	289	\$53,436	98.24
54.	AGRICULTURE SERVICES, FORESTRY & FISHERIES	486	\$53,436	98.24
55.	RETAIL TRADE	12,116	\$53,436	98.24
56.	SOCIAL SERVICES & MEMBERSHIP ORGNS.	2,115	\$53,436	98.24
57.	APPAREL & OTHER TEXTILE PRODUCTS	1,887	\$53,436	98.24
58.	HOUSES & OTHER LIVING PLACES	1,824	\$53,436	98.24
59.	PERSONAL SERVICES	781	\$53,436	98.24
60.	FARMS	1,182	\$53,436	98.24
61.	PRIVATE HOUSEHOLDS	727	\$53,436	98.24
62.	ALL DOMESTIC INDUSTRIES	84,737	\$22,818	-

SOURCE: U. S. DEPARTMENT OF COMMERCE REPORTS

NRIC 8/24/83

**AVERAGE ANNUAL COMPENSATION PER FULL-TIME EMPLOYEE,
BY INDUSTRY, RANKED FROM HIGH TO LOW**

1981

RANK (1)	INDUSTRY (2)	NO. OF EMPLOYEES (3)	AVERAGE ANNUAL COMPENSATION (4)	PERCENT OF EMPLOYEES EARNING AT LEAST (5)
1.	PETROLEUM & COAL PRODUCTS	213	\$43,728	89
2.	SECURITY COMMODITY BROKERS & SERVICES	247	\$41,757	89
3.	AIR TRANSPORTATION	798	\$40,817	89
4.	TRANSPORTATION BY AIR	433	\$40,817	89
5.	RAILROAD TRANSPORTATION	469	\$39,682	89
6.	COAL MINING	224	\$39,588	89
7.	METAL MINING	183	\$39,076	89
8.	PRIMARY METAL PRODUCTS	1,118	\$38,972	89
9.	HOLDING & OTHER INVESTMENT COMPANIES	186	\$38,925	89
10.	TELEPHONE & TELEGRAPH	1,127	\$38,067	89
11.	PIPELINES, EXCEPT NATURAL GAS	22	\$37,182	89
12.	OIL & GAS EXTRACTION	269	\$37,182	89
13.	TOBACCO MANUFACTURES	68	\$37,182	89
14.	OTHER TRANSPORTATION EQUIPMENT	1,838	\$37,182	89
15.	ELECTRIC, GAS & SANITARY SERVICES	817	\$37,182	89
16.	CHEMICALS & ALLIED PRODUCTS	1,893	\$37,182	89
17.	WATER TRANSPORTATION	2,283	\$37,182	89
18.	MACHINERY, EXCEPT ELECTRICAL	2,431	\$37,182	89
19.	PAPER & ALLIED PRODUCTS	878	\$37,182	89
20.	MISCL. PROFESSIONAL SERVICES	994	\$37,182	89
21.	LEGAL SERVICES	492	\$37,182	89
22.	TRUCKING & WAREHOUSING	1,213	\$37,182	89
23.	WASTEWATER TREATMENT PRODUCTS	1,282	\$37,182	89
24.	INSTRUMENTS & RELATED PRODUCTS	713	\$37,182	89
25.	STONE, CLAY & GLASS PRODUCTS	631	\$37,182	89
26.	NONMETALLIC MINERALS	775	\$37,182	89
27.	ELECTRIC & ELECTRONIC EQUIPMENT	874	\$37,182	89
28.	WHOLESALE TRADE	1,168	\$37,182	89
29.	CONSTRUCTION	3,931	\$37,182	89
30.	MOTION PICTURES	178	\$37,182	89
31.	FEDERAL GOVERNMENT	1,185	\$37,182	89
32.	FOOD & KINDRED PRODUCTS	1,886	\$37,182	89
33.	PRINTING & PUBLISHING	1,151	\$37,182	89
34.	ROBBER & MISCL. PLASTIC PRODUCTS	722	\$37,182	89
35.	INSURANCE CARRIERS	1,235	\$37,182	89
36.	INSURANCE AGENTS, BROKERS & SERVICES	448	\$37,182	89
37.	TRANSPORTATION SERVICES	1,981	\$37,182	89
38.	STATE & LOCAL GOVERNMENT	11,154	\$37,182	89
39.	LUMBER & WOOD PRODUCTS	643	\$37,182	89
40.	MISCL. REPAIR SERVICES	274	\$37,182	89
41.	BANKING	1,564	\$37,182	89
42.	REPAIR SERVICES	3,828	\$37,182	89
43.	CREDIT AGENCIES OTHER THAN BANKS	386	\$37,182	89
44.	MISCL. MANUFACTURING INDUSTRIES	398	\$37,182	89
45.	BUSINESS SERVICES	2,918	\$37,182	89
46.	REAL ESTATE	951	\$37,182	89
47.	FURNITURE & FIXTURES	446	\$37,182	89
48.	LOCAL & INTERURBAN PASSENGER TRANSIT	245	\$37,182	89
49.	TEXTILE MILL PRODUCTS	794	\$37,182	89
50.	AUTO REPAIR SERVICES & GARAGES	535	\$37,182	89
51.	AMUSEMENT & RECREATION SERVICES	618	\$37,182	89
52.	EDUCATIONAL SERVICES	1,143	\$37,182	89
53.	FOODS & KINDRED PRODUCTS	2,328	\$37,182	89
54.	AGRICULTURE SERVICES, FORESTRY & FISHERIES	413	\$37,182	89
55.	RETAIL TRADE	12,176	\$37,182	89
56.	SOCIAL SERVICES & MEMBERSHIP ORGNS.	2,180	\$37,182	89
57.	PERSONAL SERVICES	1,143	\$37,182	89
58.	HOTELS & OTHER LODGING PLACES	1,143	\$37,182	89
59.	FARMS	1,137	\$37,182	89
60.	PRIVATE HOUSEHOLDS	748	\$37,182	89
	ALL DOMESTIC INDUSTRIES	86,778	\$28,372	-

SOURCE: SURVEY OF CURRENT BUSINESS, JULY 1982 / VOLUME 62.
UNITED STATES DEPARTMENT OF COMMERCE.

NRIC 9/20/82

**AVERAGE ANNUAL COMPENSATION PER FULL-TIME EMPLOYEE,
BY INDUSTRY, BASED ON RICH TO LOW**

1966

RANK (1)	INDUSTRY (2)	NO. OF EMPLOYEES (3)	AVERAGE ANNUAL COMPENSATION (4)	PERCENT OF EMPLOYEES AT THE LOWEST COMP. (5)
1.	PETROLEUM & COAL PRODUCTS	282	148,735	89.87
2.	SECURITY, COMMODITY BROKERS & SERVICES	213	148,223	89.87
3.	MOTOR VEHICLES & EQUIPMENT	207	147,445	89.87
4.	TRANSPORTATION BY AIR	202	146,794	89.87
5.	COAL MINING	206	146,794	89.87
6.	RAILROAD TRANSPORTATION	566	138,573	87.28
7.	PIRE MINING	788	138,573	87.28
8.	PRIMARY METAL PRODUCTS	1,744	138,573	87.28
9.	PIPELINES, EXCEPT NATURAL GAS	322	138,573	87.28
10.	TELEPHONE & TELEGRAPHS	1,182	138,573	87.28
11.	OTHER TRANSPORTATION EQUIPMENT	1,893	137,715	87.28
12.	HOLDING & OTHER INVESTMENT COMPANIES	182	137,715	87.28
13.	PIPELINES, EXCEPT NATURAL GAS	322	137,715	87.28
14.	TELEPHONE & TELEGRAPHS	1,182	137,715	87.28
15.	OTHER TRANSPORTATION EQUIPMENT	1,893	137,715	87.28
16.	WATER TRANSPORTATION	188	137,715	87.28
17.	TOBACCO MANUFACTURES	87	137,715	87.28
18.	MACHINERY, EXCEPT ELECTRICAL	2,444	137,715	87.28
19.	PAPER & ALLIED PRODUCTS	881	137,715	87.28
20.	MISCL. PROFESSIONAL SERVICES	944	137,715	87.28
21.	RADIO & TELEVISION	179	122,547	85.87
22.	TRUCKING & WAREHOUSING	1,251	122,547	85.87
23.	FABRICATED METAL PRODUCTS	1,878	122,547	85.87
24.	STONE, CLAY & GLASS PRODUCTS	858	122,547	85.87
25.	LEGAL SERVICES	637	122,547	85.87
26.	NONMETALLIC MINERALS, EXCEPT FUELS	122	121,863	85.87
27.	INSTRUMENTS & RELATED PRODUCTS	252	121,863	85.87
28.	WHOLESALE TRADE	5,974	121,863	85.87
29.	CONSTRUCTION	3,874	121,863	85.87
30.	ELECTRIC & ELECTRONIC EQUIPMENT	2,876	121,863	85.87
31.	MOTION PICTURES	168	122,889	86.27
32.	FOOD & KINDRED PRODUCTS	1,625	122,889	86.27
33.	PRINTING & PUBLISHING	1,787	122,889	86.27
34.	INSURANCE CARRIERS	1,217	122,889	86.27
35.	INSURANCE AGENTS, BROKERS & SERVICES	433	119,718	85.75
36.	SHOES & MISCL. PLASTIC PRODUCTS	788	119,718	85.75
37.	TRANSPORTATION SERVICES	1,202	119,718	85.75
38.	STATE & LOCAL GOVERNMENT	11,283	119,718	85.75
39.	LOAN & CREDIT SERVICES	658	119,718	85.75
40.	MISCL. REPAIR SERVICES	268	117,640	85.87
41.	BANKING	4,587	117,640	85.87
42.	REPAIR SERVICES	4,761	117,640	85.87
43.	CREDIT AGENCIES OTHER THAN BANKS	545	116,837	85.87
44.	MISCL. MANUFACTURING INDUSTRIES	389	116,837	85.87
45.	BUSINESS SERVICES	2,746	115,882	85.87
46.	RECREATION & VICTIMS	430	115,882	85.87
47.	REAL ESTATE	332	115,882	85.87
48.	LOCAL & INTERURBAN PASSENGER TRANSIT	245	115,882	85.87
49.	TEXTILE MILL PRODUCTS	819	114,683	85.87
50.	AUTO REPAIR SERVICES & GARAGES	538	114,683	85.87
51.	AMUSEMENT & RECREATION SERVICES	682	114,683	85.87
52.	LEATHERS & LEATHER PRODUCTS	227	114,683	85.87
53.	EDUCATIONAL SERVICES	1,145	114,683	85.87
54.	AGRICULTURAL SERVICES, FORESTRY & FISHERIES	389	114,683	85.87
55.	RETAIL TRADE	12,893	112,435	85.87
56.	APPAREL & OTHER TEXTILE PRODUCTS	1,288	111,715	85.87
57.	PERSONAL SERVICES	2,153	111,715	85.87
58.	SOCIAL SERVICES & MEMBERSHIP ORGNS.	982	111,715	85.87
59.	HOTELS & OTHER LODGING PLACES	982	111,715	85.87
60.	FARMS	1,145	9,787	8.95
61.	PRIVATE HOUSEHOLDS	735	9,787	8.95
	ALL DOMESTIC INDUSTRIES	85,986	118,611	

SOURCE: SURVEY OF CURRENT BUSINESS, JULY 1967 / VOLUME 62.
UNITED STATES DEPARTMENT OF COMMERCE.

NRLC 9/28/82

REBUTTAL VERIFIED STATEMENT

OF

L. I. PRILLAMAN

NS EXECUTIVE VICE PRESIDENT - MARKETING

My name is L. I. Prillaman. I am Executive Vice President-Marketing, Norfolk Southern Corporation, Norfolk, VA. I am the same L. I. Prillaman who submitted a verified statement previously in this proceeding. That statement is contained in Volume 2B of the Application.

In this statement, I would like to address one of the subjects which was raised in filings by certain individual shippers and shipper groups in this proceeding. This subject concerns Conrail transportation contracts and the need for a reasonable time for transition from Conrail to NS/CSX.

Section 2.2(c) of the Transaction Agreement between CSX and NS (see Volume 8B, pp. 24-29) states that NS and CSX will undertake to perform for the remainder of their terms all of Conrail's obligations and duties under transportation contracts in effect when the acquisition is closed. The Agreement further specifies how the performance of such contracts will be allocated as between NS and CSX.

The 2.2(c) allocation between NS and CSX is based upon location of the origins and destinations of the movements under the contracts. The performance of contracts which involve movements to or from stations on lines NS will serve directly and which CSX does not is to be allocated to NS. Likewise with CSX, contract performance involving movements between Shared Asset Areas, between stations NS and CSX will serve jointly, and between stations in Shared Asset Areas and other jointly served stations is to be divided 50-50

between CSX and NS under a protocol to be agreed upon by them. Accordingly, some of the commenting shippers and shipper groups in their filings have expressed concern with our proposal with respect to the allocation of service under transportation contracts, especially those that are to be divided 50/50 between NS and CSX. Some look on the proposed agreement as an imposition and inconsistent with the central theme of the CSX-NS proposal to introduce rail competition into markets that have had none for a number of years (see *e.g.*, APL, NYK, Eastman Kodak, and others). These parties would like the option to immediately reopen their long-term Conrail transportation contracts because of certain competitive reasons or because they feel that the NS-CSX plan will create a "new ball game" with new players and new ground rules. Others only want a role in the allocation process (see *e.g.*, NIT League, Occidental Chemical Corporation and Terra Nitrogen).

I will attempt to explain why it is not feasible to immediately open Conrail's transportation contracts as of the Closing (the date, after the Control Date, that Conrail operations are allocated between Norfolk Southern and CSX).

Norfolk Southern and CSX are taking extreme care to plan in every detail the complex process of transition from Conrail operations to separate CSX and Norfolk Southern operations. The level of detail is greatest in the Shared Asset Areas -- the very areas where the 50/50 allocation under Section 2.2(c) has its primary applicability. Numerous parties to this proceeding, particularly including the Federal Railroad Administration, have rightly insisted that railroad operations and safety must not be compromised during the transition.

Railroad operations are a function of the traffic to be handled. Therefore, CSX and Norfolk Southern must decide how the traffic under a transportation contract is to be handled between the two of them in order to provide the service. During the first few critical

months of the transition, it would be extremely difficult to handle the traffic and effect the transition smoothly in any other way.

I am aware of the sometimes numerous and varied requirements of any service package to handle rail traffic. Equipment, often specialized, whether rail-owned or shipper-supplied, and crews must be assembled. The traffic will require yarding or switching. Trains must be blocked and scheduled and capacity constraints or conflicts with other movements averted. These resources and obligations must be allocated between Norfolk Southern and CSX on an agreed basis to serve contract customers.

Every one of the components of the rail service package entails careful planning, investment, and scheduling. This service package is dependent on an accurate assessment of the volumes to be handled, which is a product of the assigned provision.

Added to this planning challenge is our lack of information about Conrail transportation contracts. The only way for Norfolk Southern and CSX to plan for effective and efficient service on Closing Date is to know what contract business each will need to handle. Consequently, a process which opened up Conrail transportation contracts immediately as of the Closing Date could very well compromise operations during a transition period. Thus, allocation of the service requirements under transportation contracts between NS and CSX in an organized way is probably an unavoidable operational necessity on Day One.

After the two systems are up and running smoothly and the transition process has been completed, each will make adjustments over time to new service demands as carriers do on an everyday basis. Since the systems will not have that capability on the Closing Date, reopening of all contracts on that date is simply not feasible.

VERIFICATION

COMMONWEALTH OF VIRGINIA)

) SS:

CITY OF NORFOLK

)

L. I. Prillaman, being duly sworn, deposes and says that he is Executive Vice President-Marketing for Norfolk Southern Corporation, that he has read the foregoing verified statement, knows the facts asserted therein and that the same are true as stated.

L. I. Prillaman
L. I. PRILLAMAN

Subscribed and sworn to before me.
a Notary Public in and for the
State and City aforesaid, this
5th day of December, 1997.

Sandra J. Worley
NOTARY PUBLIC

My commission expires:

MARCH 31, 1996

[SEAL]

**REBUTTAL VERIFIED STATEMENT
OF
FRANKLIN E. PURSLEY**

My name is Franklin E. Pursley. I am Vice President - Operations Support and Safety Integration Officer for CSX Transportation, Inc. ("CSXT"). I have held my position as Vice President - Operations Support since 1995 and assumed my position as Safety Integration Officer in June, 1997. I have been employed by CSX or its predecessor since 1970, and have held a variety of positions, including Vice President - Service Quality (1987 - 1989), Vice President - Transportation (1989 - 1990) and Vice President - Transportation Services (1990 - 1995).

In my role as Vice President - Operations Support, I am responsible for the safe operation of CSXT and compliance with federal safety regulations administered by the Federal Railroad Administration ("FRA") and other agencies. As Safety Integration Officer, I have assumed specific responsibility for the safe integration of CSXT and Conrail operations following any Board approval of the Application for control of Conrail by CSX and Norfolk Southern that is pending in this proceeding. My responsibilities extend to all aspects of safety integration -- including workforce issues, equipment issues, and operational issues. In carrying out these responsibilities, I am charged with reviewing, from a safety perspective, the experiences that CSXT has had in its own prior mergers, and the experiences of other recent railroad mergers, so that CSXT is positioned to apply the lessons of previous mergers and acquisitions to the Conrail transaction. I am also charged with working with safety officials from other railroads, the Association of American Railroads and FRA with the goal of identifying the "best practices" that can be applied to particular

integration issues so as to ensure a safe and smooth transition.

Of course, I am not a "one-man team" in these efforts. As I will discuss further below, CSXT has organized an impressive set of teams, composed of executive management and other rail officials, to plan and implement the safe integration of the portions of Conrail that will be operated by CSXT and the portions that will be operated jointly with NS in the Shared Assets Areas.

I understand that safety issues are being addressed in detail through the environmental review process that is currently underway in this proceeding. The Environmental Impact Statement ("EIS") that the Board will have before it at the time that it renders a decision in this proceeding will address safety in detail, including CSXT's plans for the safe integration of Conrail lines and assets that are proposed to be operated by CSXT. On December 3, 1997, in response to Board Decision No. 52, we submitted for inclusion in the Draft EIS a 243 page Safety Integration Plan ("SIP") that describes in detail CSXT's current plans. Jointly with NS, we also submitted a SIP for the Shared Assets Areas. (NS also submitted its own SIP for the Conrail lines to be operated by it.) As these SIP's explain, successful safety planning is by necessity a dynamic process. Therefore, the SIP's should not be viewed as the definitive or final description of our plans. Nonetheless, the SIP's offer a detailed view of the depth of the planning efforts and identify the areas where we are applying our safety planning energies.

I do not intend in this Statement to repeat all of the data that are set forth in the SIP's. Instead, my purpose is to: (1) describe the safety benefits of the Conrail transaction, (2) address some of the reasons why this transaction is different from the Union

Pacific/Southern Pacific merger transaction to which so many parties have alluded in their comments, (3) summarize the extensive safety planning process that CSX has undertaken to ensure a smooth transition and (4) address safety-related issues that certain parties have raised in their comments filed with the Board.

**I. **The Conrail Transaction Will Further
The Public's Interest in Safe Transportation****

Lost in the focus of so many parties on the UP/SP problems is the fact that the operation of Conrail's assets by CSXT and NS should result in a safer transportation system than exists today. There are at least three reasons for this that I will address.

First, while Conrail has a fine, and improving safety record, both CSXT and NS have accomplished even more in this area (and, as I will discuss further below, have better safety records than UP or SP). The Verified Statement of Mr. Edward R. English, the Director of FRA's Office of Safety Assurance and Compliance, submitted with the October 21, 1997 Comments of the Department of Transportation (DOT-3), correctly observes that "CSX and NS have had the two best safety records among large U.S. railroads for the last six years . . ." In the past seven years, CSXT has reduced its employee injury rate by 79 percent and its train accident rate by 64 percent. In terms of accidents/train miles, the measure used by DOT, CSXT has the best record among all of the Class I railroads, and its accident rate is one half that of Conrail's. This impressive safety record is a more reliable predictor of future safety benefits from this transaction than any other.

CSXT's strong safety record is the result of a corporate commitment to safety throughout the organization. A centerpiece of CSXT's safety process are the Overlapping

Safety Committees, headed by CSXT's Executive Vice President and Chief Operating Officer. These cross-functional committees meet regularly to address safety issues brought to them by employees and other safety committees organized throughout the railroad. The committees have generated a series of safety initiatives (described in more detail in our SIP), including aggressive programs to address grade crossing safety; to train local emergency personnel on rail accident prevention and emergency response and to prevent hazardous materials incidents. CSXT has also fostered an environment in which effective employee-run (and CSXT-supported) safety programs have developed. These include Operation Prevention, a peer intervention program designed to identify and work with employees whose work habits appear to be potentially unsafe. A list of some of the nationally-recognized safety awards that CSXT has earned is set forth in the Environmental Report, CSX/NS-23, at pp. 121-122.

Conrail's safety record, which is sound, has been improving. Nonetheless, in view of the better safety records of CSXT and NS, the extension of the strong safety cultures and tested practices of those railroads to Conrail can reasonably be expected to result in an overall improvement of Eastern railroad safety. This point is discussed further in the Verified Statement of Dr. Ian Savage, a rail safety expert who has studied the safety records of all major U.S. railroads. Dr. Savage concludes that extension of CSXT and NS safety practices to Conrail could result in a significant reduction in Conrail accident rates.

The safety benefits that should accrue from the extension of CSXT safety programs to Conrail properties are long-term benefits. To ensure safety in the short term, as little as possible will change on so-called "Day One," the date on which the Conrail assets

will be split between CSXT and NS. The Conrail personnel that currently operate Conrail will continue to operate the allocated territory and, with few exceptions, Conrail operating practices and systems will remain unchanged.

Over time, we will continue to explore, as we have already begun to do, Conrail safety practices and make judgments as to whether to retain the Conrail practice, apply the CSXT practice (assuming it is different) or reach some other conclusion. It is not our intent, for example, to scrap the impressive array of Conrail hazardous materials safety programs that Mr. English lauds in his statement. Our goal is to study these programs and identify how they differ from the comparable CSXT programs. (CSXT's hazardous materials safety programs are also very successful. In 1996, for example, CSXT experienced only 4 hazardous materials incidents, involving 5 cars out of 338,000 hazardous materials cars handled, in which hazardous materials were released as a result of derailment -- an impressive spill rate of just .0012 percent.) We will ascertain the best elements of each railroad's programs and, as in other areas, we will use a "best practices" approach so that, at the end of the integration process, we will have drawn from the most effective of each railroad's safety programs. To the extent that practices are changed, however, CSXT is committed to a measured approach that will not disrupt service or safety.

The second reason that this transaction will enhance safety is that it will result in a very significant diversion of freight from all-highway carriage to intermodal transportation in which the long-haul portion will be handled by CSXT. Both CSXT and NS have predicted, between them, a total of approximately one million truck-to-rail diverted intermodal units over the next several years. These diversions will result from the expanded

single-line rail service and the greater opportunities for attracting freight from the highways that will follow from improved single-line transit times and associated new service offerings.

There is no debate in the safety community that rail transport is significantly safer than highway transport. Part 2 of the Environmental Report submitted with the Application (Volume 6B) at pages 34-36 quantifies the safety benefits of these truck to rail diversions. As reported there, the projected decrease in truck miles should result in a decrease of 1,690 large truck crashes, including 429 crashes involving injuries and 21 crashes involving one or more fatalities as a result of the CSXT and NS division of Conrail.

The third safety benefit that will flow from the Conrail transaction will result from reduced switching activity. Rail yard activities, including the switching of cars, are inherently more dangerous than line-haul operations. With the melding of the Conrail system into CSXT and NS, the volume of such switching activity will be reduced, in part because of the elimination of switching between CSXT and Conrail and in part because of more efficient routings that will be made possible by the transaction. Dr. Savage addresses this point in more detail in his testimony.

II. Concerns About the Conrail Transaction Based on the UP/SP Experience are Unfounded

Despite the safety benefits of this transaction, several parties to this proceeding are endeavoring to exploit the UP/SP situation, and unfounded fears of chaos that will result from the Conrail transaction. Some parties may be playing on unfounded safety fears to further their own agendas. Numerous parties have predicated their request for conditions on the false proposition that the condition they seek is needed to avoid a repeat of the UP/SP

situation, when in fact the requested condition is designed to further the goals of that party rather than the public interest.

It is not my intent here to minimize the UP/SP problems or to suggest that the UP/SP experience does not offer a lesson to any two railroads (or other businesses) that choose to integrate their operations. Rather, I will endeavor to place the UP/SP situation in its proper perspective and to explain why CSX believes that the Conrail transaction will not result in the same types of operational and safety problems that UP is now addressing.

First, there is the matter of safety records. A railroad's historic safety record is a major indicator as to how the railroad will perform going forward. On this basis, the Conrail transaction is clearly a safety plus, as I have noted above. CSXT has a better safety record than Conrail, as shown by the graph that appears at page 4 of the October 21 Comments of the U.S. Department of Transportation (DOT-3), DOT-3 at 17, and so does NS.

According to DOT's Comments (DOT-3) at page 4, the safety records of UP and SP stand in contrast to that of CSXT. DOT's report of accident rates indicates that, since at least 1991, UP and SP have had consistently higher accident rates than CSXT and NS. In 1996, the accident rates of these two Western railroads were more than twice that experienced by CSXT.

Second, Conrail is a healthy railroad with a strong safety culture and numerous excellent safety programs already in place. The DOT Comments in fact laud Conrail safety practices in numerous areas, including the handling of hazardous materials and bridge safety. By contrast, SP's financial and related problems at the time of its acquisition

by UP have been widely reported.

Third, the UP/SP merger was much larger in terms of the size of the operations that one railroad was absorbing. UP was taking over an SP rail system that stretched well over 16,000 miles to form a single railroad with a total of over 36,000 miles of track. By contrast, CSXT will operate 42% of Conrail, a total of approximately 4,100 miles of track. The size of the proposed CSX and NS operations over Conrail lines is thus a fraction of the UP/SP transaction. In addition, we will not be abandoning any significant line segments, while by contrast UP undertook a major rationalization of the UP and SP systems.

Fourth, prior to merging with SP, UP had only recently completed its merger with C&NW. There is no comparable situation here.

Fifth, CSXT workforce levels in safety-sensitive areas will not be reduced on Day One, and in fact will be increased in several key areas, meeting a concern that some have raised about post-merger UP staffing levels. Also, CSXT plans on hiring about 850 conductors and engineers in 1997 and over 1,000 more in 1998. CSXT is also purchasing approximately 50 new locomotives in 1998 and planning to invest significantly in track, signal and facility improvements over the next several years. These investments include planned upgrades to Conrail facilities that will be allocated to CSXT.

Sixth, it appears that we have had more time to consider and address safety integration than did UP. CSX first initiated its current efforts to assume control of Conrail in 1996, but has been studying a possible Conrail acquisition for the last several years. Full-scale safety planning efforts, involving several teams of rail officials and key executive

personnel, have been underway since June 1997. These efforts will continue well into 1998, beyond the date of any decision of the Board allowing CSX and NS to attain control of Conrail and leading up to Day One. This planning process, described in further detail below, is unprecedented in its scope and will cover each of the safety-sensitive areas of railroad operations. Conrail personnel will be involved throughout the process. In contrast, the UP proceeding was decided on a much faster track. The Board's procedural schedule in that proceeding was considerably shorter (by 140 days) than that in this case.

In addition to the distinctions between our situation and the UP/SP case, FRA has assumed a pro-active safety role in this transaction. CSXT has addressed each of the areas of most concern to the FRA in its SIP, which the FRA has reviewed for both sufficiency and reasonableness. DOT has advised the Board in the December 3 letter of its General Counsel Nancy McFadden that "CSX and NS are submitting well-reasoned SIP's that DOT believes to be adequate for inclusion in the draft EIS" Through the SIP process and continuing consultations with CSXT and NS on safety matters, FRA will be an active participant with the railroads in assuring a smooth and safe transition that takes full account of the lessons learned from the UP/SP experience.

III. CSXT Has Been Engaged in an Extensive and On-Going Safety Planning Process

CSXT is itself the product of several major rail mergers, most recently the 1980 merger of the Chessie System and Seaboard Lines. Each of these mergers -- several of which involved the reallocation of substantially more track and operating assets than are involved in this transaction -- was accomplished without a serious safety problem. For example, the Chessie/Seaboard merger involved the integration of two large rail systems --

Chessie operated over 11,400 route miles and Seaboard over 16,600. While the merger took place in 1980, the operations of these two systems were not melded until 1985. Since that time, safety on the combined system has improved. The merged system achieved an impressive safety record from the outset, and the number of FRA-reportable personal injuries and train accidents declined (and has continued to decline) consistently following the merger.

The experience of the Chessie/Seaboard merger and other prior mergers has laid the foundation for the safety planning process undertaken by CSXT in connection with the Conrail transaction. We have learned that safe integration requires long-term planning and a significant commitment of personnel resources. Over 50 integration planning teams have been organized at CSXT to address each major area of rail operations -- e.g., operating practices, dispatching, crew management, technology, headquarters integration, and so forth. These teams are composed of senior executives, managers and others who will actually be involved in implementation of the plans that are being developed.

A series of integration planning teams are organized as so-called "Day One Operations Teams." The goal of these teams is to plan for the day on which CSXT operations will begin on the Conrail allocated lines. Among other matters, these teams are developing and reviewing plans for hiring train crews and dispatchers, plans for operations in the Shared Assets Areas, and technology plans to ensure that Conrail systems and CSXT systems are compatible on Day One and that sufficient redundancies are built into the systems. All of these efforts are being managed by a former Conrail executive that CSXT hired this year as its Vice President for Consolidation.

Safety is a central focus of the efforts of the Day One Operations Teams, as

well as the dozens of other integration planning teams that CSXT has organized. The scope of issues that are addressed in the CSXT safety planning process is described in detail in the SIP. In accordance with SIP Guidelines provided by FRA, and in response to the DOT Comments, the SIP addresses CSXT's safety integration planning in each of the following areas:

- Safety Culture -- The SIP describes how CSXT has attained a leadership position in safety practices through its Overlapping Committee Safety Process and other initiatives. To underscore its commitment to safety, CSXT is planning a President's Roundtable Safety Forum to be chaired by CSXT President and CEO A.R. Pete Carpenter.
- Training -- CSXT has specific plans to train affected employees on every change in operating procedures. These plans are described in the SIP.
- Operating Practices -- The SIP describes CSXT's plan to continue Conrail operating practices unchanged on Day One, with only those exceptions needed to ensure safe and FRA-compliant operations systemwide.
- Motive Power and Equipment -- CSXT plans to retain almost all existing Conrail mechanical field forces on the allocated territory on Day One and will hire additional personnel as needed. CSXT also intends to modify Conrail fueling stations allocated to it to switch to a safer, industry standard fueling system.
- Signal and Train Control -- CSXT will invest substantial resources in track, signal and facility improvements over the next three years. CSXT will also extend its signal training and certification program to the Conrail lines, while continuing joint efforts to explore Positive Train Separation technologies.
- Track and Structures -- CSXT will maintain Conrail's track and bridge inspection program in place on Day One before adopting a unified program based on "best practices." CSXT will extend its formal training and field certification programs to Conrail, which does not currently have such a program.
- Hazardous Materials -- CSXT will meld its outstanding programs with Conrail's to further improve performance. Training and community outreach programs will continue.

- Dispatching -- As of Day One, CSXT will retain dispatching from Conrail's current offices at Albany and Indianapolis. Consolidation of dispatching in Jacksonville is a long-term goal.
- Highway-Rail Grade Crossings -- Both railroads are actively involved with public authorities in closing crossings or improving warning systems. This will not change. CSXT will retain Conrail's involvement in Operation Lifesaver, the national grade crossing education/awareness program in which CSXT also participates. CSXT will review Conrail's safety practices in this area and adopt a "best practices" approach.
- Allocation of Personnel -- The various sections of the SIP describe CSXT's plans. Generally, CSXT will ensure adequate staffing levels. The overall decline in the workforce will not be substantial.
- Employee Quality of Life -- Both CSXT and Conrail have active programs to ensure that employees receive adequate rest opportunities and that a healthy workforce is retained. These programs will be continued and integrated.
- Freight and Passenger Service -- CSXT will honor Conrail's commitments under its operating agreements with commuter agencies. All safety related rules and practices now in place will remain in place. Some safety improvements will also be realized.
- Information Systems -- CSXT and Conrail technology experts are already working together to design and implement a plan for systems migration that will be required for safe operations. Adequate redundancies and contingency plans are also being formulated.

Each of these same safety focus areas is also addressed in the separate SIP that CSXT and NS have prepared, in consultation with Conrail, for the Shared Assets Areas operations to be conducted by the Conrail Shared Assets Operations ("CSAO"). Safety in those areas will be the primary responsibility of the CSAO, the efforts of which will be supported by both CSXT and NS. As the CSAO SIP discloses, a considerable amount of coordination planning has already been undertaken with respect to safe rail operations in these areas.

In many areas, CSXT and Conrail practices are not dramatically different from

one another. As the SIP indicates, CSXT has studied the differences that do exist between its practices and Conrail's practices in each area and has planned an approach to integrate the activities of both railroads, with an emphasis on identifying and implementing "best practices."

As I have already noted, the preparation of the SIP was not the beginning of the CSXT safety planning process (which began months before the SIP was prepared). Nor is it the end of that planning process. Safety planning will continue up through "Day One" and beyond. The goal is to have a slow and measured integration of practices that builds on our experience with Conrail operations and practices.

IV. Safety Concerns Raised by Several Parties are Misplaced

DOT's Comments are focused exclusively on safety. Our goal is to work cooperatively with FRA safety officials to address any concerns that they might have. We have done so already through the SIP process, and I want to assure the Board that we will continue our cooperative consultations with FRA as we move forward toward integration in the event that the Board approves the proposed Conrail transaction.

Apart from FRA, several other parties have raised safety-related concerns in their comments filed in this proceeding. I will address these concerns here.

Allied Rail Unions (ARU-23) and Other Rail Union Filings -- In its comments, ARU repeatedly points to UP's recent problems and claims that the same safety problems will befall CSXT and NS. I have already addressed the differences between the UP situation and the Conrail transaction.

The focus of ARU's concern is manpower allocation and expanded seniority

districts. These issues are addressed in the Joint Rebuttal Verified Statement of Kenneth R. Peifer and Robert S. Spenski and in the Rebuttal Verified Statement of John Orrison.

ARU claims that CSXT's plans for centralized dispatching will lead to the types of safety problems experienced by UP. Centralized dispatching is common in the rail industry, and has been the rule at CSXT for many years. CSXT believes that centralization of dispatching leads to better coordination and communication and thus enhances safety. Further, the current decentralized Conrail dispatching will remain in place for the near term.

ARU repeatedly points to the FRA's findings in a recent audit of CSXT as evidence that CSXT's safety practices are inadequate. ARU's concerns are not well founded. FRA recently concluded a Safety Assurance and Compliance Program ("SACP") audit of CSXT, conducted as part of FRA's continuing oversight of rail industry safety. CSXT has responded fully to the findings of the SACP audit, which found some areas where CSXT is excelling and others that need improvement. While CSXT does not agree with all aspects of the FRA's findings, CSXT has set up a team to address the areas that FRA identified as needing more attention and measures are already being implemented to enhance our programs.

Further, as noted, FRA is engaged in an open dialogue with CSXT on safety planning for the Conrail transaction and will be working with CSXT as the integration process moves forward. The FRA's continuing role should serve to further allay any remaining safety concerns that ARU might have.

Several other filings by rail union interests raise the same set of issues raised by ARU. These filings are by John F. Collins, for the Brotherhood of Locomotive

Engineers ("BLE"); International Association of Machinists and Aerospace Workers (IAM-4); Transportation-Communications International Union (TCU-4); Transportation Trades Department, AFL-CIO; United Railway Supervisors Association; and New York State Legislative Board of the United Transportation Union. Each of these filings offers a bleak prediction of future job cuts and safety problems, largely predicated on the UP/SP experience. We appreciate the concerns expressed by these union representatives, but do not share their vision of the future. CSXT remains committed to adequate workforce staffing and to careful safety planning, as shown by its SIP.

American Trucking Associations -- This motor carrier trade association asks the Board to condition this proceeding on a commitment by CSXT and NS to upgrade or remove "the many hazardous highway grade crossings along the Conrail lines." ATA-6 at 8. ATA does not identify these crossings, and supports its requested condition with no more than some very general rhetoric about the dangers of rail crossings.

ATA's requested condition is unwarranted. As described in the Environmental Report and the SIP, CSXT has an aggressive program in place to reduce grade crossing collisions. These efforts have resulted in a decline in the number of collisions per million train miles from 10.9 to 5.8 in 1996, a decrease of 47 percent. Conrail has also reduced its collisions per train mile during the same period from 10.5 to 4.4, a decrease of 58 percent. In fact, Conrail has been an industry leader in this area, with the fewest number of crossing crashes per million train miles among the Class I railroads. These issues are addressed in further detail in the Environmental Report (Volume 6B at 27-32) and the SIP.

ATA claims that as of 1990, "of the 176,572 public crossings, over 110,000

had no active warning systems (that is, no devices that indicated the approach of a train); nearly 75,000 had no advance warning devices of any kind; and at about 42,500 crossings, the crossbucks did not meet uniform standards." ATA-6 at 6. It is not clear why ATA has chosen to rely on grade crossing figures that are seven years old when FRA publishes new statistics annually. The 1996 figures show a continuing trend toward fewer crossings and better crossing protection nationwide. They also show that Conrail has a better than average record here. In 1996, Conrail had 12,286 public crossings at grade and active, train-activated warning signals at over half of these crossings.

Congressional Parties -- Congressman Robert Menendez

raises a safety concern based on the proposition that "CSX is facing a \$2.5 billion jury award over a 1987 crash involving hazardous material[s]. . . ." The Congressman's concerns are misplaced in several respects. First, CSX believes that this inappropriate jury award will be overturned. The Supreme Court of Louisiana in fact has vacated the judgment, which should allow CSX to progress its post-trial remedies and appeal without the need for posting a bond. Second, the incident at issue had nothing to do with rail transportation provided by CSXT. CSXT's involvement in the 1987 tank car fire that triggered the lawsuit is based solely on the fact that CSXT owned the interchange track on which the tank car was located. The tank car had been fitted with an improper gasket by a lessee of the car, which improper gasket caused the fire. CSXT did not own the tank car, repair the car, transport the car, load the car or own the contents of the car. Further, an National Transportation Safety Board report issued on this matter found no fault on CSXT's part.

Congressman Menedez also claims that "the proposed Conrail merger

envision a Shared Asset Area with no operating plans, no plans for investment in facilities already operating at full capacity, expectation of huge increases in traffic, and vastly reduced labor forces in the most densely populated area in the nation." Congressman Menedez may be right about population density and anticipated traffic increases, but he is wrong on every other count.

First, CSXT and NS have submitted a North Jersey Shared Asset Area ("NJSAA") Operating Plan (CSX/NS-119) pursuant to Board Decision No. 44. The NJSAA Operating Plan offers a detailed description of NJSAA operations. Second, CSXT has plans for investment in NJSAA facilities and other capital projects that will benefit the NJSAA. These are described CSX/NS-119 at 116-118. Third, there are no plans for a "vastly reduced labor force" in the NJSAA. To the contrary, plans for the safe allocation of employee work forces in the Shared Areas are set forth in detail in the Shared Assets Areas SIP prepared by CSXT and NS.

Congressman Menendez also expresses concerns about the impact of the transaction on NJT. Those impacts, which will be minimal, are described in the Operating Plan submitted with the Application, the NJSAA Operating Plan, the Environmental Report and the SIP. In addition, the Verified Statement of Paul R. Reistrup submitted with this rebuttal addresses concerns that NJT has raised in this proceeding.

Congressman Dennis J. Kucinich raises concerns about the adequacy of post-transaction staffing levels in safety-sensitive positions. These issues have been addressed above.

Shell Oil Company -- The Verified Statement of David L. Hall, a

management consultant for Shell Oil Company and Shell Chemical Company questions CSXT's commitment to safety, citing only a news report about the FRA safety audit, which I have discussed above. (SOC-3 at pp. 9-10). Mr. Hall, who does not purport to be a safety expert, offers no evidence to support his incorrect assessment that safety has "begun to slip" at CSXT. The facts prove otherwise, as I have demonstrated. CSXT's record in safely transporting the types of hazardous materials that Shell transports is exemplary, as I have noted above and as further underscored by the fact that CSXT earned the 1996 Transportation Community Awareness and Emergency Response (TRANSCAER) award issued by TRANSCAER, a nationwide community outreach program that addresses hazardous materials transportation. Further, as our SIP explains, CSXT, like Conrail, is working to implement full participation in the Responsible Care Partnership program organized by the Chemical Manufacturers Association. Our participation in that important and rigorous safety program is a further sign of our commitment to safety in this area. Our SIP, and the Shared Areas SIP, also address in significant detail the plans for a safe integration of the CSXT and Conrail hazardous materials safety programs.

State of Ohio Parties -- The Ohio Attorney General, Ohio Rail Development Commission and Public Utilities Commission of Ohio question CSXT's decision to transfer its existing Ohio "Trouble Desk" to Jacksonville. (OAG-4 at 42-43). It is not clear what "Trouble Desk" is being described. CSXT, which has extensive operations in Ohio today, does not have any sort of "Trouble Desk" in that state. Rather, as is common in the rail industry, we have centralized police and dispatching functions in Jacksonville and have made available an "800" number that citizens or local authorities can use to reach CSXT police

officials, who are trained to take the appropriate action, whether that be contacting the dispatcher or local authorities. The transaction will have no impact on these procedures.

Conrail currently maintains a signal and communications desk in Columbus, Ohio that serves as a center for receiving telephone calls concerning signal problems in Ohio and in all other states in which Conrail operates. While no final decision has made, CSXT anticipates transferring the functions of that systemwide desk to Jacksonville, consistent with CSXT's operations on the rest of its system. This transfer will have no detrimental safety implications for the state of Ohio or any other state currently served by that Conrail facility.

Other Parties -- Several states and local interests filed comments raising concerns with respect to the safety implications of projected increased traffic on line segments of interest to those localities. I understand that these localized impact issues will be addressed in detail in the Board's Draft Environmental Impact Statement and thus I will not comment further on these issues here.

VERIFICATION

STATE OF FLORIDA)
)
COUNTY OF DUVAL)

Franklin E. Pursley, being duly sworn, deposes and says that he is Vice President - Operations Support and Safety Integration Officer of CSX Transportation, Inc., that he is qualified and authorized to submit this Verified Statement, and that he has read the foregoing statement, knows the contents thereof, and that the same is true and correct.

Franklin E. Pursley

Franklin E. Pursley

Subscribed and sworn to before me by him this 5th day of December, 1997.

Dianne L. Johns
Notary Public



**REBUTTAL VERIFIED STATEMENT OF
GORDON C. RAUSSER AND ROBIN A. CANTOR**

TABLE OF CONTENTS

I. INTRODUCTION	1
II. QUALIFICATIONS.....	1
III. BACKGROUND.....	3
IV. SUMMARY OF CONCLUSIONS	4
V. ANALYTICAL AND EMPIRICAL CONCERNS ABOUT THE FRA'S ANALYSIS OF ADVERSE RISK EFFECTS.....	5
V.1 THE FRA SURVEYS	6
V.2 THE ZETA-TECH STATISTICAL ANALYSIS.....	7
VI. THERE IS SUBSTANTIAL EVIDENCE THAT SHOWS ACQUISITIONS ARE NOT DETRIMENTAL TO SAFETY.....	9
VI.1 SAFETY AND ORGANIZATIONAL CHANGE IN THE RAIL INDUSTRY.....	10
VI.2 SAFETY AND ORGANIZATIONAL CHANGE IN OTHER TRANSPORTATION INDUSTRIES.....	14
VII. CONCLUSIONS.....	15

VERIFICATIONS

ATTACHMENTS

APPENDICES

I. Introduction

Our names are Gordon C. Rausser and Robin A. Cantor. Gordon Rausser is Dean of the College of Natural Resources and the Robert Gordon Sproul Distinguished Professor at the University of California at Berkeley and a Principal of Law & Economics Consulting Group, Inc. ("LECG"). Robin Cantor is a Managing Economist of LECG. LECG is an economics consulting firm that specializes in the application of economics to complex legal and public policy issues.

This Rebuttal Verified Statement is submitted solely on behalf of Norfolk Southern Railway Company ("NS"), not on behalf of the Applicants jointly. The statement's purpose is to describe our analysis and conclusions regarding the studies of safety relied upon by the Federal Railroad Administration ("FRA") as a basis for its concerns about the Conrail transaction. We reviewed the supporting data and documentation for the statement of Mr. Edward R. English, Director of the FRA's Office of Safety Assurance and Compliance. Our analysis is based upon an independent examination of the findings presented by Mr. English as evidence of potential safety problems emerging from the Conrail transaction. Our analysis focused on the logical and statistical reliability of data sources, models and findings used by Mr. English to make inferences about the potential safety implications of the Conrail transaction. Our review emphasizes the general analytical approach and assumptions used by FRA to form its opinions about safety, and is not an analysis of the specific operating issues which stem from FRA's review of the transaction application. It is our understanding that the latter issues have been addressed by the Applicant Railroads in the Safety Integration Plans filed with the Surface Transportation Board ("STB") on December 3, 1997.

II. Qualifications

Qualifications of Gordon C. Rausser

I am the Dean of the College of Natural Resources and the Robert Gordon Sproul Distinguished Professor at the University of California at Berkeley. I received a Ph.D. With Highest Honors from the University of California at Davis in 1971 and in 1973 was awarded a Postdoctoral Fellowship in Economics and Statistics at the University of Chicago. In 1987 I was a Fulbright Scholar in Australia.

In my academic career, I have held positions teaching economics and statistics at many universities including the University of Chicago, Hebrew University, Harvard University, University of Illinois, Iowa State University, and the University of California at Davis. I have published extensively in academic and professional journals in the areas of industrial organization, public policy, agricultural and natural resource economics, and the application of statistical methods. During my academic career, I have published more than 175 articles, books, and book chapters. In addition, I have written more than 65

Commissioned Papers, Governmental Reports, and Working Papers. I have won fourteen national awards and honors for my teaching and research.

I am a Fellow of the American Association for the Advancement of Science (1994), the American Statistical Association (1991) and the American Agricultural Economics Association (1990). I am a past editor of the *American Journal of Agricultural Economics* and a past associate editor of the *Journal of the American Statistical Association* and the *Journal of Economic Dynamics and Control*. From 1986 to 1987, I was Senior Economist at the President's Council of Economic Advisors. Following that position, I served as the Chief Economist at the Agency for International Development in Washington, DC from 1988 to 1990.

In addition to my academic experience, I serve on a number of boards of directors of private companies and as a Principal and Corporate Secretary of LECG. I have extensive consulting experience in economic damage analysis, environmental remediation cost allocation, economic feasibility studies, predatory pricing and price fixing allegations, water quality contamination, regulated industries, antitrust analysis, market analysis, and statistical modeling. Over the course of my 25 year professional career, I have offered opinions on the use of statistical sampling and modeling in over 30 cases. Within the past four years, I have testified as an expert in more than 25 cases, 7 of which involved courtroom trial testimony and two of which involved arbitration testimony.

Appendix LECG-A is a copy of my *curriculum vitae* (c.v.) which contains a list of my publications and a list of expert testimony within the last 4 years.

Qualifications of Robin A. Cantor

I am a Managing Economist in the Environmental and Natural Resource Economics Practice of the Washington DC office of LECG. I received a Ph.D. in economics from Duke University in 1985. Prior to joining LECG in September, 1996, I was Director of the Decision, Risk, and Management Science Program, a research program of the National Science Foundation. From 1982 to 1991, I was a senior researcher at Oak Ridge National Laboratory. I currently have a faculty appointment in the Graduate Part-Time Program in Environmental Engineering and Science of the Johns Hopkins University.

I have been actively involved in the planning and coordination of several programs that link fundamental natural and social science, policy, and risk management. I am a past Coordinator for the NSF Human Dimensions of Global Change, the NSF Methods and Models for Integrated Assessment, and the NSF/EPA Decision Making and Valuation for Environmental Policy. I was Vice-Chair for the US Global Change Research Program Working Group on Assessment Tools and Policy Sciences, NSF Principal for the Committee on the Environment and Natural Resources' Subcommittee on Risk Assessment, and Liaison to the Subcommittee on Social and Economic Sciences. While at ORNL, I was Technical Assistant to the Associate Director for Advanced Energy Systems

which included divisions in energy technologies, fusion, fossil energy, and advanced materials.

My research and consulting expertise includes several areas of environmental economics, risk management, public policy and societal decision making. My duties as Director of the NSF Decision, Risk and Management Science Program included the review of grant proposals which covered risk-related research in engineering, health, information technology, transportation, energy, and the environment, as well as all of the social and behavioral sciences. My duties at LECG include the analysis and communication of risk and economic issues in asbestos litigation, solid waste management, property value diminution, industrial pricing, and comparative transportation risks. My forty publications include refereed journal articles, book chapters, reports for federal sponsors, and a co-authored book on economic exchange under alternative institutional and resource conditions.

I am a current Councilor of the Society for Risk Analysis, where I am also Chair of the Grants Management Committee and a member of the Annual Meeting's Program Committee for 1996 and 1997. I am a past President of the board of directors for MATRIX, The Business Center for Women and Minorities. I serve or have served on science review and advisory boards for the Harvard Center for Risk Analysis, the Johns Hopkins University Graduate Part-Time Program in Environmental Engineering and Science, the National Center for Environmental Decision-making Research, the Carnegie Council on Ethics and International Affairs, the National Oceanic and Atmospheric Administration, the National Academy of Public Administration, and the Consortium for International Earth Science Information Network. I currently serve on the editorial boards of the *Journal of Risk Analysis* and the *Journal of Risk Research*.

Appendix LECG-B is a copy of my c.v. which contains a list of my publications. I have not provided trial or deposition testimony in the last four years.

III. Background

On June 23, 1997, CSX Corporation and CSX Transportation, Inc. ("CSX"), Norfolk Southern Corporation and Norfolk Southern Railway Company ("NS"), and Conrail, Inc. and Consolidated Rail Corporation ("Conrail") (collectively, "Applicants"), filed an application with the Surface Transportation Board ("STB") seeking approval and authorization for (1) the acquisition by CSX and NS of control of Conrail, and (2) the allocation of the use of Conrail's assets between CSX and NS.

The US Department of Transportation ("DOT"), through the Federal Railroad Administration ("FRA"), is the federal agency with plenary authority over the safety of the railroad industry. On October 21, 1997 the DOT submitted preliminary comments on the proposed transaction to the STB.¹ In its comments, the DOT does not take a position on

¹ See Preliminary Comments of the U.S. Dep't of Transportation, Finance Docket No. 33388 (Oct. 21, 1997).

the merits of the application or as to whether relief would be required in the public interest as a condition to any approval by the STB. Instead, the DOT raises in its comments a number of issues concerning effects of the transaction on the US rail industry. These issues include the transaction's impact on competition, increased train volumes for some communities, passenger rail operations, railroad employees, and the financial prospects of the Applicants.

In DOT's view, "the most important issue raised by the pending transaction is its potential effect on safety."² To describe its concern, DOT submitted the Verified Statement of Edward R. English. Mr. English's statement expresses the DOT's "growing concern that the ever larger size and complexity of major Class I railroads, and thus of consolidations involving such carriers, pose a risk to safety in the absence of very careful and detailed implementation planning."³ On November 3, 1997, the STB ordered the Applicants to file within 30 days a Safety Integration Plan that addresses the concerns raised by Mr. English in his statement.

Mr. English's statement is based on three studies carried out by or on behalf of FRA to examine the safety implications of the transaction. The first study is an analysis of the UP/SP and BNSF mergers. Included in this first study is an evaluation of safety culture in the context of merging organizations. The second study is a general review of issues that FRA states were not addressed adequately in the Applicants' filings. Included in the second study is a statistical analysis of risk by line segments that was conducted by ZETA-TECH Associates, Inc. for the FRA. The third study is a detailed review conducted by teams of FRA personnel of seven functional areas which might be affected by the transaction.⁴

IV. Summary of Conclusions

The Applicants have argued that for the acquired system and the portions of the current systems affected by the transaction, expected total accidents will decline and safety will improve.⁵ They base this argument on an analysis of accident rates and expected changes in train miles. In fact, FRA recognizes that CSX and NS have the best accident rates among class I railroads.⁶ Applying the CSX and NS accident rates both to the existing Conrail system and the planned traffic increases results in a net reduction of 52 accidents per year.⁷

² *Id.* at 4.

³ *Id.* at 6.

⁴ These areas include operating practices, motive power and equipment, track and structures, signal and train control, hazardous materials, dispatch centers, and highway-rail crossings. See Verified Statement of Edward R. English, Finance Docket No. 33388 (Oct. 17, 1997).

⁵ See 6A Railroad Control Application, Finance Docket No. 33388, at 75 to 77 (June 1997).

⁶ See English Statement, *supra* note 4, at 17.

⁷ See 6A Railroad Control Application, *supra* note 5, at 75.

In contrast, FRA's analysis looks to the recent, but very particular, experience of two other large railroad mergers and a forecasting model to examine the possible implications for safety. FRA's concerns that safety will suffer as a result of the transaction, however, are based upon evidence and methods which do not represent a balanced analysis of the future safety performance of the Applicants. Our analysis has shown that:

1. Survey results cited by FRA as evidence for merger problems are not based on sound and generally accepted survey design and protocol;
2. Results from the ZETA-TECH model of accident cost are biased and do not reflect known differences in the safety performances of Conrail, CSX, and NS;
3. Notwithstanding the bias in the data set, when results of the ZETA-TECH accident model are interpreted correctly given their statistical uncertainty, there is no significant increase in cost; and
4. FRA conclusions about culture, acquisitions, and safety are not supported either by references to professional analysis of these issues or by reliable empirical study of the Applicants or of other railroads. Our review of literature on these issues reveals a number of reasons to expect an improved safety performance from this transaction.

The materials we relied upon for our opinions are listed in Appendix LECG-C. We have also relied upon the research and investigation efforts carried out by the staff of LECG working under our direct supervision.

V. Analytical and Empirical Concerns About the FRA's Analysis of Adverse Risk Effects

Mr. English's statement is based upon a collection of studies to examine relationships between mergers and existing safety and operating patterns. These studies include (1) an analysis of the recent UP/SP and BNSF mergers and potentially relevant safety problems as identified in part by a post-merger safety survey of FRA staff that appears to have been conducted internally by FRA, (2) a second survey of FRA staff regarding potential safety problems resulting from the Conrail transaction, and (3) statistical analyses of accident costs for certain subject rail line segments and grade-crossings.

We find that these studies do not provide a sound conceptual or fact-based analysis of the implications of this transaction. The surveys do not meet professional standards for design and protocol. As we understand their structure, they are more likely than not to elicit biased responses because they requested immediate subjective reactions and there appears to be no sampling design to select respondents and ensure representative perspectives.

The statistical analysis is also an unreliable basis for the safety concerns because it fails to reflect known differences regarding the safety performances of the Applicants and modeling error is ignored in the application. As reported by Mr. English, the results of the ZETA-TECH modeling are point estimates of the 1995 costs of segment accidents.⁸ Similarly, the year 2000 forecast is reported as a point estimate. This ignores that the model is not a perfect predictor of the actual data and will forecast with error. When estimation error is reflected in the model estimates, we cannot reject the hypothesis that there is no statistically significant increase in risk as measured by the year 2000 cost of accidents forecast.

V.1 The FRA Surveys

We have reviewed the supporting work papers for the two surveys and the statistical analyses. Our review revealed comments from survey respondents and data collectors that indicated that the UP/SP safety assessment survey had no formal design. There appear to be several different types of information requested and the response formats are unstructured. Attachment LECG-1 is a summary of the materials provided by the FRA as the work papers for the UP/SP survey. It shows that several information requests were being implemented and that no structured format guided the responses.

The Conrail transaction survey appears to have some structure for responses, but it is completely subjective in content and there is no summary analysis of the results. Moreover, we could find nothing in the work papers to suggest a sampling design, so there is no basis for knowing if the responses are representative. The supporting FRA work papers indicate that these surveys are essentially information requests to the FRA staff for subjective reactions to the mergers.⁹

⁸ Estimates based on a single estimated or forecast value are called "point estimates." A point estimate will not provide any information on the likely range of error. For this reason, it is standard statistical practice to report a confidence interval around point estimates. Confidence intervals convey the precision of the estimate. A common practice is to require no more than a 5% chance that an estimated value will lie outside the confidence interval. Once the level of precision is selected, knowledge of the model's estimation error is used to derive the upper and lower bounds of the confidence interval.

⁹ The following statements from written guidelines for the safety assessment surveys support our concern that these judgments were formed hastily.

- "Do sitting at your desk off the top of your head. If you cannot arrive at an immediate conclusion, mark the item "No Opinion" as noted below because there is not enough time to do anything else."
- "As you recall the announced future intentions . . . please factor these into your decisions. If you are not reasonably sure, then simply indicate "No Opinion"."
- "Rating scheme:
 - 1 "0" is excellent, "10" is very poor
 - 2 Unsure, don't know, no opinion: mark with an "X".

For the yard evaluation sheet:

- "When considering a location, provide an immediate response based on your experience and in accordance with the rating scheme noted below (same as for the route segments). There is no time for research."

We understand from survey instructions that the FRA had a limited amount of time to conduct these analyses. This may account for the shortcomings we find in the methodology. As a matter of standard practice, however, the survey instrument and response collection protocol are critical for the quality of the data collected and the reliability of the survey results.

V.2 The ZETA-TECH Statistical Analysis

To evaluate the implications of the transaction on accident risk, ZETA-TECH examined accident costs for certain subject Conrail, CSX, and NS line segments. ZETA-TECH estimated a model of average annual accident cost per line segment. Accident costs were based on data from 1989-1996. An "eight-year average cost" was derived from these yearly data. The eight year average per segment was used to estimate a model of cost that included train miles, curvature, and indicator variables for each of the three firms. These indicator variables are included in the model to capture inter-railroad differences in accident risk. Once estimated, the model was used to estimate a "Year 1995" value and forecast the "Year 2000" value.

ZETA-TECH's various calculations have little probative value because of major defects, any one of which could be fatal. Specifically:

- The results do not properly incorporate or reflect known differences in the safety performance of Conrail, CSX and NS
- The model is not properly structured to detect and measure potential inter-railroad accident cost differences, even though this is the entire point of the exercise.
- ZETA-TECH ignores the fact that statistical estimates are made with error, and when properly viewed, the results are consistent with no accident cost effects from the transaction.

The data used by ZETA-TECH to estimate the accident cost model are not valid representations of the safety performances of the Applicants. Attachment LECG-2 shows system safety performance for seven years as measured by annual accident rates (preliminary rates for 1997) for Conrail, CSX, and NS. Standard statistical tests confirm that Conrail's performance is significantly worse than that of NS and CSX.

In contrast, the data relied upon by ZETA-TECH do not exhibit these distinguishing characteristics. Attachment LECG-3 shows the accident rates for the data set. Again, we applied standard statistical tests to look for significant differences in the underlying patterns of accident rates. These tests, however, fail to reject that the data for all three operators come from the same underlying pattern of accident risks when based on the limited segments used in the ZETA-TECH model. This means that the segments analyzed

by ZETA-TECH are not representative of the railroads' actual safety experiences with their systems.

The main point of statistical accident (cost) analysis is to estimate inter-railroad differences in accident costs, allowing for other relevant factors. In its model, ZETA-TECH allows the data to inform us about this key difference in safety performance in one and only one way: through shifts in the average level of accident costs. The results of the ZETA-TECH model, however, only serve to confirm that these data do not reveal the known safety distinctions among the railroads.

Attachment LECG-4 shows the results of tests to compare accident costs across firms. Differences across firms are measured by indicator variables included in the model. The statistical uncertainty surrounding the estimates of each firm's effect on costs is sufficiently large that each test result is consistent with there being no difference among railroads in cost experiences. In other words, the model is telling us that there are no *statistically* significant safety distinctions among the railroads even though the *estimates* show small differences.

Moreover, neither ZETA-TECH's "1995" cost estimate nor their forecast for the year 2000 can be statistically distinguished from their "8-year average cost." We reached this conclusion by estimating the statistical uncertainty surrounding the ZETA-TECH estimates and forecast, using the generally accepted and appropriate method of confidence intervals.

As we have already indicated, estimates based on a single estimated or forecast value are called "point estimates." A point estimate will not provide any information on the likely range of error. For this reason, it is standard statistical practice to report a confidence interval around point estimates. Confidence intervals convey the precision of the estimate. Once the level of precision is selected, knowledge of the model's estimation error is used to derive the upper and lower bounds of the confidence interval.

Our confidence intervals for both the "Year 1995" prediction and the "Year 2000" forecast bracketed the "8-year average cost," indicating that neither the 1995 prediction nor the 2000 forecast can be statistically distinguished from the 8 year average value.¹⁰ Thus, the ZETA-TECH results are entirely consistent with there being no discernible effect of this transaction on accident costs.

Our conclusion on the accident costs is based on careful analysis of ZETA-TECH's own data, in the framework of their model (which we do not endorse) to take account of the inherent statistical uncertainty surrounding any accident cost estimates. This uncertainty is

¹⁰ The methods used in calculating the variance of ZETA-TECH's nonlinear transformation of their predicted values and the confidence intervals for the estimate and the forecast were based on standard and accepted statistical methods as discussed by William H. Green, *Econometric Analysis*, p. 57, 196 (2d ed. 1993). We used the 5% level of significance for calculating the upper and lower bounds, which is standard practice.

ignored by both ZETA-TECH and Mr. English in their interpretations of the model results.¹¹ A proper consideration of statistical uncertainty yields the following results from the ZETA-TECH model:

Figure LECG-1: 95% Confidence Intervals on ZETA-TECH Actual and Adjusted Values¹²

8-Year Average Cost = \$23,582,157			
	Lower Bound	Year 1995	Upper Bound
Actual	\$16,203,309	\$20,910,017	\$25,616,725
Adjusted	\$18,273,968	\$23,582,157	\$28,890,346
	Lower Bound	Year 2000	Upper Bound
Actual	\$18,303,737	\$23,564,375	\$28,825,012
Adjusted	\$20,642,815	\$26,575,721	\$32,508,627

For the "Year 1995," the \$23.6 million estimate is highly uncertain, by conventional standards—the confidence interval spans from 77.5% to 123% of the prediction. Proper analysis of the "Year 2000" forecast reveals the major flaw of the ZETA-TECH results and interpretation. Here, the confidence interval widely brackets the 8-year average of \$23.6 million. In other words, the \$23.6 million value for the 8-year average is well within the range \$20.6 - \$32.5 million. Thus, this "prediction" cannot be statistically distinguished from the 8-year average. We conclude that the ZETA-TECH model does not provide a basis for predicting an increase in accidents due to this transaction.

VI. There is Substantial Evidence That Shows Acquisitions Are Not Detrimental to Safety

Mr. English relies heavily on the analysis of two particular mergers, UP/SP and BNSF, to infer that large railroad consolidations lead to safety problems. He acknowledges that there are several reasons to have anticipated safety problems with the UP/SP and BNSF mergers.

¹¹ A similar criticism applies to the analysis of grade-crossing accidents. We did not receive a grade crossing accident model from ZETA-TECH, but their analysis for grade crossing accidents also relies on point estimates without any consideration of the error in these forecasts.

¹² The actual values are the predicted values from ZETA-TECH's model. The adjusted values incorporate ZETA-TECH's adjustment to calibrate the results to the 8-year average dollar costs.

Prior to their mergers, three of the four railroad parties had relatively poor safety records... with UP having the highest rate of any of the large railroads for five of the last six years. Southern Pacific consistently had the second highest rate (except for 1995, when it led the industry in major accident rate). It is then, perhaps no surprise that the merged company (UP/SP) has experienced safety problems almost since the day of the merger. These problems have been aggravated by rapid traffic growth and shortages of both locomotives and the crews to operate them. This has led to major disruption in UP/SP services to customers, overworked supervisors, overworked train and engine service personnel and a severe shortage of qualified employees in Texas (Houston) and other UP/SP system locations. So again, it might have been anticipated that the new company, faced with booming traffic and the challenge of operating service over more than 3,500 miles of trackage rights on competitor UP, would exhibit a relatively poor safety performance.¹³

According to Mr. English, "the poor safety experiences of the UP/SP merger and the safety related problems FRA also identified in the context of the BNSF merger"¹⁴ and the potential complexities of this transaction led FRA to conclude that a safety assessment of the proposed transaction was imperative.

Data on the railroad industry, however, demonstrate that the UP/SP performance discussed by FRA is not a general result. Acquisitions and mergers have been on-going, large, and wide-spread in the industry since the early 1980s. The accident data do not suggest that this has been detrimental for safety. In fact, as we argue below, the opposite conclusion is more consistent with the data. Notably, preliminary data on 1997 UP and BNSF accidents rates are *lower* than the comparable period in 1996, and lower than rates for calendar 1996.¹⁵

VI.1 Safety and Organizational Change in the Rail Industry

The structure of the railroad industry has changed dramatically since the passage of the Staggers Act in 1980. According to the United States General Accounting Office ("GAO")

From 1976 through 1995, the nation's largest freight railroads cut costs; increased the tonnage each train carried and the distance this tonnage was carried; downsized their

¹³ See English Statement, *supra* note 4, at 2-3.

¹⁴ *Id.* at 17.

¹⁵ The FRA Preliminary Summary for Jan-Jun 1997 show rates for UP and BNSF of 3.28 and 2.71 (accidents per million train miles), respectively. The comparable rates for 1996 are 4.13 and 3.60, and for calendar 1996, the rates are 4.18 and 3.31. In addition, preliminary 1997 Employee on Duty ("EOD") accident rates also show declines for UP/SP and BNSF. The 1997 rates are 2.64 and 1.47, respectively. The comparable rates for 1996 were 3.04 and 1.86. See Federal Railroad Administration Office of Safety, U.S. Dep't of Transportation, *Accident Incident Bulletin*, Nos. 160-65 (1992-97).

workforce, and eliminated, sold, or abandoned thousands of miles of unprofitable or little-used track.¹⁶

In short, the competition fostered by the Staggers Act has greatly improved the efficiency of rail services. Notably, increases in efficiency have been coincident with substantial merger activity. GAO reports that in 1976, 88 class I railroads accounted for 98 percent of industry revenue and 89 percent of the train miles. In 1995, 15 class I railroads accounted for 91 percent of the revenue and 82 percent of the train miles.¹⁷

An equally notable change in railroad economics stems from improvements in safety. Accident prevention has been a high priority for the railroad industry. In fact, we have seen dramatic improvements in accident rates. Attachment LECG-5 shows that accident rates have dropped to less than a third of what they were in 1976 for the nation as a whole.

The declining accident rate has not occurred by chance. During the 1960s and 1970s, increases in average train lengths, car sizes, and loadings increased derailment rates.¹⁸ In contrast, capital investments, deregulation, and technological change are cited as factors in the decline of accident rates during the 1990s.¹⁹ All of these safety improvements have been made in an environment of increasing merger activity among the railroads.

The decline in accidents rates, however, has slowed in the 1990s. GAO reports that the annual percentage decline in accidents was 9% in the 1976-87 period and fell to a 2% annual rate in the 1987-95 period. The more recent accident data show an increasing proportion of accidents are caused by human factors and error.²⁰ More generally, industry analysts recognize that the most easily identified accident causes have been addressed and further improvements to safety are becoming more difficult to identify.

After many years of industry efforts to improve safety, it is not easy to identify where further effort would be best allocated for the greatest effect. There are two reasons for this. One is that no single problem stands out as being dramatically larger than the

¹⁶ GAO, *Rail Transportation: Federal Railroad Administration's New Approach to Railroad Safety* 2 (Pub. No. GAO-RCED-97-142, July 1997).

¹⁷ *Id.* at 15.

¹⁸ See R. E. Thompson et al., *Hazardous Materials Car Placement In A Train Consist — Vol. I (Review and Analysis)* 15 (U.S. Dep't of Trans. Report No. DOT/FRA/ORD-92/18.1, 1992).

¹⁹ See Aviva E. Harvey et al., *Statistical Trends in Railroad Hazardous Materials Transportation Safety 1976 to 1986* at 1-6 (Association of American Railroads Pub. No. R-640, 1987).

²⁰ Federal Railroad Administration, U.S. Dep't of Transportation, *Enhancing Rail Safety Now and into the 21st Century: The Federal Railroad Administration's Safety Programs and Initiatives* 13 (1996).

STB

FD-

33388

ID-184826

12-15-97

D

27/60

others. Second, the relatively low rate of accidents in recent years provides less statistical information with which to work.²¹

Because it is becoming increasingly difficult to identify accident causes from empirical studies, it is not surprising that competing perspectives on railroad management and operations are used to explain risk causes. In its review of railroad safety, the GAO identified these fundamental differences in operational perspectives:

Safety on the nation's railroads has improved since 1976, although the most rapid decrease in accidents occurred before 1987. FRA and industry officials attribute these improvements to advancements in technology, increased investment focused on a downsized infrastructure, and a more scientific approach toward reducing injuries. However, class I freight railroads, which account for most of the industry's revenues and train miles, are now using fewer people, locomotives, and cars to haul more tonnage over fewer miles of track. Labor officials believe that these changes in operations could lead to more rail collisions and accidents as a result of greater congestion and fewer qualified employees to perform essential maintenance. While current safety trends are positive, it is uncertain how further advancements in technology or reductions in employment will affect safety in the future.²²

The GAO report makes clear that one of the results from years of mergers, acquisitions, track reductions, and technological improvements is downsizing of the railroad labor force. Attachment LECG-6 shows the decline in class I freight railroad employment between 1976 and 1995. This decline in employment does not appear to have been detrimental to safety, as measured by data on accident rates which have fallen 74% since 1976.

More recently, analysts have raised incompatibilities in safety cultures as an additional detrimental influence on safety performance following large mergers or acquisitions. We do not dispute that organizational factors such as safety culture may play a role in safety performance. We have already noted that accidents caused by human factors and errors have not experienced the dramatic reductions since deregulation that we find in non-human causes. Attention to the interaction of organizations factors and individual actions that might contribute to accident rates is a natural extension of the scientific approach to safety improvements.

Few phrases occur more frequently in discussion about hazardous technologies than *safety culture*. Few things are so sought after and yet so little understood. However, should anyone think that the current preoccupation with safety culture is just another

²¹ Christopher P. L. Barkan, *Data Requirements for the Development of a Quantitative Risk Assessment Model for Rail Transportation of Hazardous Materials*, Conference on the Transportation of Hazardous Materials and Wastes, at 2-85 to 2-88 (1991).

²² GAO, *supra* note 16, at 4.

passing fact, consider the following facts. Commercial aviation is an industry that possesses an unusual degree of uniformity world-wide. Airlines across the globe fly much the same types of aircraft in comparable conditions. Flight crews, air traffic controllers and maintenance engineers are trained and licensed to very similar standards. Yet, in 1995, the risks to passengers (the probability of becoming involved in an accident with at least one fatality) varied by a factor of 42 across the world's air carriers. While factors such as national and company resources will play their part, there can be little doubt that differences in safety culture are likely to contribute the lion's share to this enormous variation.²³

Scholarly research on cultural factors, however, is limited and does not provide the kinds of general conclusions that can easily be extrapolated to a specific case. The current state of the art in the study of corporate culture is best summarized by the following statement from leading researchers in the area:

The literature on organizational cultures consists of a remarkable collection of pep talks, war stories, and some insightful in-depth case studies. There is, we believe, a dearth of ordinary research as taught by standard behavioral research methodology textbooks.²⁴

In the context of railroad accidents, there have been some attempts to develop assessment tools for organizational and managerial root causes. As one example of the few applications, the Railway Accident Investigation Tool ("RAIT") was developed by a research team from the University of Manchester for the British Railways Board. RAIT is a practical investigative tool that builds on the analytical concepts emerging from safety culture analysis. Application of RAIT is a highly structured process involving specific attention to the influence of managerial root causes (such as training, provision of tools and equipment, materials, design, communications, rules, supervision, planning, commercial and operational pressures, and maintenance) on latent and active safety failures.²⁵

We found no documents in the work papers to show that any structured procedure like RAIT had been applied by the FRA to review the Applicant's accidents. Although the FRA work papers contain descriptions of Conrail/CSX/NS employee fatalities and train accidents for the period 1994-1997, there is no separate analysis of these accidents in the context of cultural root causes. Regulations or conditions affecting this transaction may have unintended consequences for safety if based on what appears to be a limited understanding of how safety and organizational factors interact.

²³ James Reason, *Corporate Culture and Safety*, NTSB Symposium on Corporate Culture and Transportation Safety, at 1 (1997) (emphasis in original).

²⁴ Geert Hofstede et al., *Measuring organizational cultures: a qualitative and quantitative study across twenty cases*, 35 Admin. Sci. Q. 286-287 (1990).

²⁵ Daniel E. Maurino et al., *Beyond Aviation Human Factors: Safety in High Technology Systems* 142 (1995).

VI.2 Safety and Organizational Change in Other Transportation Industries

Organization and market structural changes undertaken to gain economic efficiencies are not unique to the railroad industry. Other transportation sectors have been similarly transformed in the recent past. These transformations raised almost identical concerns about safety, organization change, congestion, and maintenance as those raised by Mr. English. It is therefore enlightening to look at airline and trucking experience as an additional source of information about the safety and organizational change relationship.

Numerous studies have been conducted on the safety of airlines and the effects of deregulation. Airline safety has been steadily improving since the Airline Deregulation Act of 1978. Safety analysts report that based on five different measures of airline accident rates, safety improved or remained statistically unchanged after deregulation in the 1979-85 period.²⁶ Moreover, review of the 1986-88 period indicates that airline mergers did not have a significant impact on safety as measured by the accident data. The same analysts review accident causes to confirm that the organizational and market structure changes did not adversely affect safety.

The rate for equipment failure related accidents in the first six years following deregulation is less than one third of the pre-deregulation rate. The 1986-88 rate is less than one half of the pre-deregulation rate. If deregulation had indeed induced shortcuts in aircraft maintenance, the rate of equipment failures might be expected to have increased. The sharp decline in this rate suggests that, at least through 1988, deregulation has not led to widespread maintenance deficiencies.

Accident rates declined in the air traffic control category, reducing the already low rate even further. In terms of accidents, there is no evidence that the air traffic control system has functioned less safely after deregulation than it did before.²⁷

Similar results have been found for worker safety in the airline and trucking industries:

In terms of the economic forces set in motion by transportation deregulation, almost all factors suggest that there should be a drop in safety as a consequence of deregulation. Moreover, if there is such a decline it is likely to be larger in the initial years of deregulation than after the industry settles down into the postderegulation equilibrium.

Examination of several BLS accident rate series fails to indicate any cause for alarm in terms of major departures from expected accident trends. There has been no apparent

²⁶ Clinton V. Oster et al., *Why Airplanes Crash: Aviation Safety in a Changing World* 23 (1992).

²⁷ *Id.* at 30-31.

upsurge in accident levels in the postderegulation period...A variety of regression specifications fail to reveal any adverse effects of deregulation.²⁸

Industry analysts have identified a number of reasons why actual safety performance does not deteriorate with changing organizational and market structures. First, there are private incentives to avoid accidents. Insurance costs, casualty losses, reputation, and employee oversight are all active incentives that encourage safety improvements.²⁹ Second, accident data are actively collected, investigated, and reported by regulatory agencies.³⁰ Third, as we have already noted, the transportation industries have paid some attention to the organizational and human factor influences on safety.

VII. Conclusions

The FRA analysis of this transaction attempts to look at a number of areas where safety problems may emerge. The FRA's review is heavily influenced by the recent, but very particular, experiences of two other large railroad combinations. While concern about the UP/SP and BNSF mergers is understandable, focus on these recent transactions to the exclusion of other relevant factors does not lead to a balanced assessment of the future safety performance of CSX and NS. FRA's approach to information sources would be of greater value for understanding the implications of this transaction if:

1. The safety correlates of the UP/SP and BNSF mergers could be extrapolated to this transaction;
2. FRA's surveys had followed sound sample designs and protocol;
3. The ZETA-TECH forecasting model was properly constructed and interpreted; and
4. The other findings of safety risk were based on reliable, preferably empirical evidence.

Our review indicates that the FRA's evidence of risk and safety effects does not provide a proper basis for predicting the consequences of this transaction. Regulations or conditions affecting the transaction, if premised on this evidence, could have unintended consequences for safety.

²⁸ W. Kip Viscusi, *The Effect of Transportation Deregulation on Worker Safety*, in *Transportation Safety in an Age of Deregulation* 89 (Leon N. Moses & Ian Savage, eds., 1989).

²⁹ Nancy L. Rose, *Financial Influences on Airline Safety*, in *id.* at 94.

³⁰ Thomas G. Moore, *The Myth of Deregulation's Negative Effect on Safety*, in *id.* at 10.

VERIFICATION

I, Gordon C. Rausser, verify under penalty of perjury that the foregoing statement is true and correct. Further, I certify that I am qualified and authorized to file this statement.

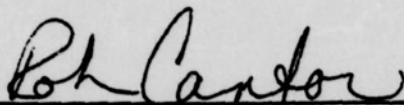
Executed on December 8, 1997.

Gordon Rausser
Gordon C. Rausser

VERIFICATION

I, Robin A. Cantor, verify under penalty of perjury that the foregoing statement is true and correct. Further, I certify that I am qualified and authorized to file this statement.

Executed on December 9, 1997.

A handwritten signature in cursive script, appearing to read "Rob Cantor", is written over a solid horizontal line.

Robin A. Cantor

Attachment LECG - 1

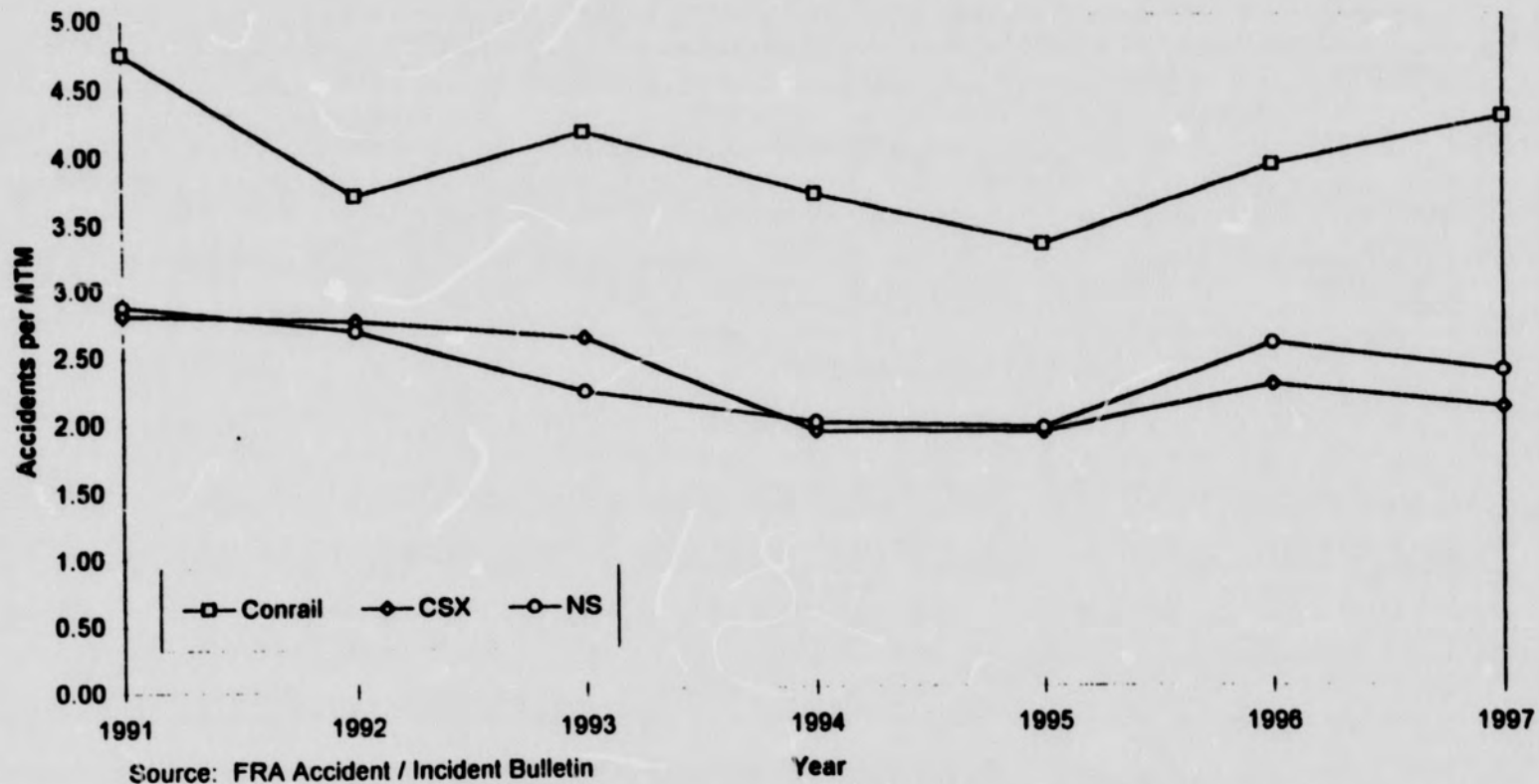
SUMMARY OF FORMATS FOR THE UP/SP MERGER SURVEYS

Respondent	Information Request	Format
1. S. Gallant	UP/SP Merger	E-mail
2. Mark Daniels ¹	Follow-Up Safety Assessment of UP/SP Merger	List of problems
3. L.H. Hasvold, Regional Administrator, RRS-44	Follow-Up Safety Assessment of UP/SP Merger	Memo/list - Operating practices and hazardous materials issues
4. David H. Green	UP/SP Merger Safety Assessment	Paper - Region 5 issues with the merger
5. R.M. Centracco, Supervisory Railroad Safety Specialist (HM), RRS-35	UP/SP Merger	Memo - Region 5 hazardous materials (actual/perceived) issues
6. Louis H. Richard, Jr., Railroad Safety Inspector (HM)	UP/SP Merger	Memo - Actual deficiencies and violations found during inspections
7. Billy J. Steel, Railroad Safety Inspector (HM), RRS-35	Follow-Up Safety assessment of UP/SP Merger	Memo - Regional actual/perceived deficiencies (San Antonio, TX)
8. W. A. Fernau, Railroad Safety Inspector (HM), RRS-35	UP/SP Merger	Memo - New Orleans actual/perceived situation
9. Tremelle Sykes, Railroad Safety Inspector (HM)	Follow-Up Safety Assessment of UP/SP Merger	Memo - Actual/Perceived safety issues in the last 12 months
10. Mark Glenn	UP/SP Merger	Unknown/List - Actual/Perceived issues in Houston Area
11. James E Duncan, Hazardous Material Inspector	Follow-Up Safety Assessment of UP/SP Merger	Memo - Various deficiencies listed
12. H.D. Campbell	UP/SP Merger	Unknown/List - Deficiencies, violations and additional problems with the UP/SP in Houston Area
13. R.A. Krippendorf, Hazardous Materials Safety Inspector	Follow-Up Safety Assessment of UP/SP Merger	Letter - Summary of actual documented hazmat safety defects and violations in Little Rock, AR territory for UP/SP
14. Henry L Jacobs	Follow-Up Safety Assessment of UP/SP Merger	Email - Some UP/SP hazardous materials field perceptions
15. Robert Scieszinski	UP/SP Merger	Email - Perceived negative impact for UP/SP trackage in Region 8
16. Jim Adams	UP/SP Merger	Email - Incidents/concerns from "the Track"
17. George E. Hardy, Jr.	Follow-Up Safety Assessment of UP/SP Merger	Email - Information on train dispatchers (SP) in Denver and some perceptions
18. Lonnie Ramos	UP/SP Merger	Email/WP Attachment-Compilation of accidents reflecting a negative impact

¹ Due to the ambiguity of the document in question, it is uncertain if Mark Daniels is the correct respondent.

Attachment LECG - 2

Accident Rates for the Entire Systems - Conrail, CSX, and Norfolk Southern -

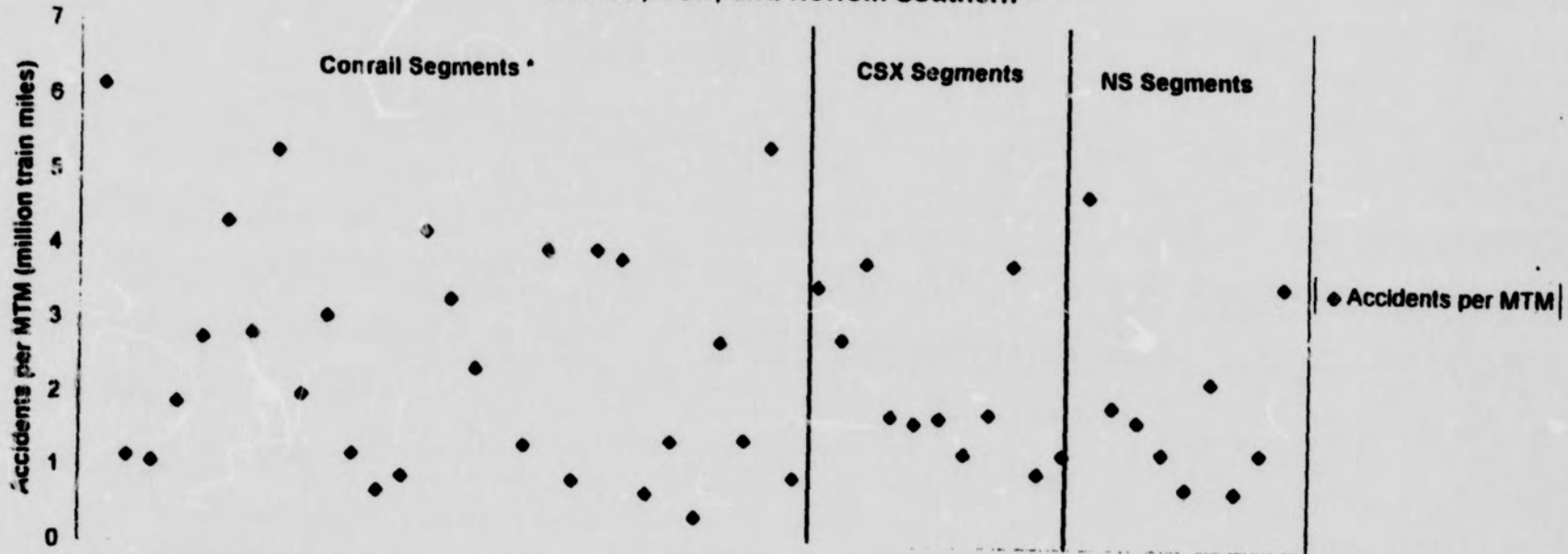


Statistical Tests for Significantly Different Risk Performance

A standard non-parametric hypothesis test for population homogeneity shows a statistically significant difference among the three railroads. Separate tests performed between Conrail and each of the two applicants (CSX and Norfolk Southern) also indicate statistically significant differences.

Attachment LECG - 3

Accident Rates for the Subject Segments - Conrail, CSX, and Norfolk Southern -



Source: ZETA-TECH database

Statistical Tests for Significantly Different Risk Performance

A standard non-parametric hypothesis test for population homogeneity shows no statistically significant differences among the three railroads. Likewise, separate tests performed between Conrail and each of the two applicants (CSX and Norfolk Southern) do not indicate any statistically significant differences.

*One Conrail segment showed an accident rate of 136 accidents per MTM and is not shown on this graph.

Attachment LECG - 4

Testing for Statistical Differences Between the System Coefficients

Indicator Variable	Parameter Estimate	Standard Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Conrail	536.91	107.26	356.68	777.13
CSX	521.52	135.83	255.30	787.75
NS	509.72	140.81	233.73	785.72

A standard hypothesis test for differences in the regression coefficients shows no statistically significant difference among the three firm variables for estimating average accident costs. The test results are shown below:

	Calculated T-value	Critical T-value
H ₀ : Conrail = CSX	0.46	< 1.96
H ₀ : Conrail = NS	0.62	< 1.96

Calculated T-values less than the critical values above indicate no statistically significant difference between the parameter estimates at the 95% level of confidence.

Figure 2.1: Total Train Accidents, All Railroads, Calendar Years 1976 Through 1995

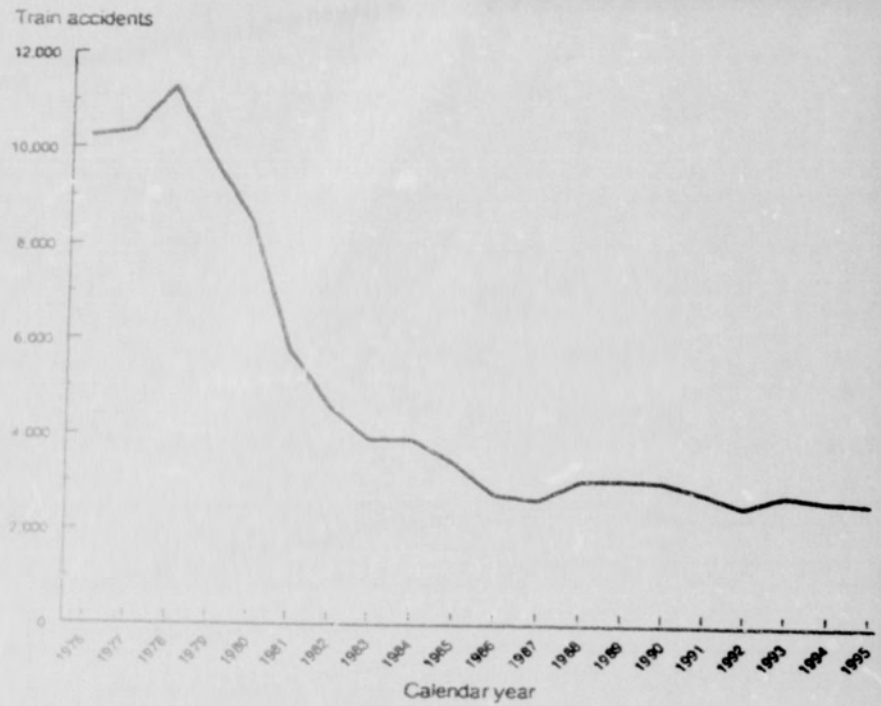
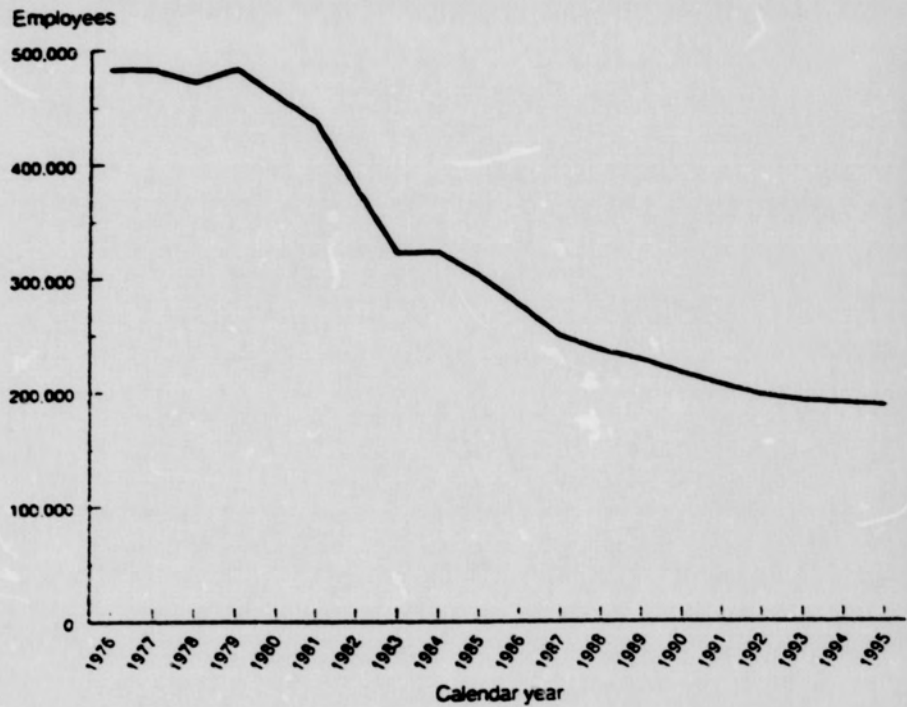


Figure 1.3: Class I Freight Railroad
Employment, Calendar Years 1976
Through 1995



Appendix LECG-A

GORDON C. RAUSSER

LECG, INC.
2000 Powell Street, Suite 600
Emeryville, CA 94608
Tel. (510) 653-9800
Fax (510) 653-9898

University of California
101 Giannini Hall
Berkeley, CA 94720
Tel. (510) 643-9942
Fax (510) 643-0287

EDUCATION

Postdoctoral Fellowship, UNIVERSITY OF CHICAGO, Chicago, IL, 1972 - 1973.

Ph.D., UNIVERSITY OF CALIFORNIA, Davis, CA, *Highest Honors*, 1971.

M.S., UNIVERSITY OF CALIFORNIA, Davis, CA, *Highest Honors*., 1968..

B.S., CALIFORNIA STATE UNIVERSITY, Fresno, CA, *Summa Cum Laude*, 1965.

PRESENT POSITION

UNIVERSITY OF CALIFORNIA, Berkeley, CA, 1994 - present.
Dean, College of Natural Resources.

UNIVERSITY OF CALIFORNIA, Berkeley, CA, 1986 - present.
Robert Gordon Sproul Distinguished Professor.

INSTITUTE FOR POLICY REFORM, Washington, DC, 1990 - present.
President.

LECG, INC., 1989 - present.
Principal.

AWARDS AND HONORS

WAEA Outstanding Published Research Award of 1994 for "Price Distorting Compensation Serving the Consumer and Taxpayer Interest." published in *Public Choice*, Vol. 77, No. 2, October, 1994.

AAEA Publication of Enduring Quality Award for contributions to environmental economics, statistical economics, statistical decision theory, and natural resource analysis, 1993.

AAEA Outstanding Journal Article Award Finalist ("Productive and Predatory Public Policies: Research Expenditures and Producer Subsidies in Agriculture"), 1992.

AAEA Distinguished Policy Contribution Award for econometric analysis of public policies, 1993.

Member, Board for International Development Studies, Fletcher School of Law and Diplomacy, Tufts University, 1992 - 1994.

Member, Board for International Development Studies, Fletcher School of Law and Diplomacy, Tufts University, 1992 - 1994.

Fellow of the American Association for the Advancement of Science, 1993.

Fellow of the American Statistical Association, 1991.

Agency for International Development, Superior Unit Citation Award, 1990.

Fellow of the American Agricultural Economics Association, 1990.

Special Recognition, "Outstanding Professional Research Contributions," *Agricultural Economics and Agribusiness*, 3rd edition, Gail L. Cramer and Clarence W. Jones, John Wiley and Sons, 1990.

AAEA Outstanding Journal Article Award Finalist ("Incomplete Markets and Government Policy"), 1989.

Member, Economic Discipline Board, Fulbright Scholarship Awards, 1989 - present.

Chairman, Intergovernmental Consultative Group on Indonesia, The Hague, June, 1989.

Cofounder of the Institute for Policy Reform, Washington, DC, 1989.

Founder of the Agency for International Development Research Fellow Program, 1989.

Chief Economist, Agency for International Development, 1988 - 1990.

Editor, *Agricultural Management and Economics*, Springer-Verlag, 1988 - 1992.

Chairman, Berkeley Department of Economics and All Economic Programs Evaluation Committee, 1987 - 1988.

Teaching and course materials in agriculture policy selected for publication in *Economics Reading Lists, Courses, Outlines, Exams, Puzzles, and Problems*, compiled by Edward Tower, Duke University, *Agricultural Economics*, Vol. 22, July, 1988.

Robert Gordon Sproul Distinguished Professor, University of California, Berkeley, CA, 1986 - present.

Senior Economist, Council of Economic Advisors, 1986 - 1987.

AAEA Award for Best Published Research ("Macroeconomic Linkages, Taxes, and Subsidies in the U.S. Agricultural Sector"), 1986.

Resident Fellow, Resources for the Future, National Center for Food and Agricultural Policy, 1984 - 1985.

Editor, *American Journal of Agricultural Economics*, 1983 - 1986.

AAEA Award for Best Journal Article ("Commodity Price Forecasting With Large-Scale Econometric Models and the Futures Markets"), 1982.

AAEA Honorable Mention Award for Best Published Research ("Dynamics of Agricultural Systems: Economic Prediction and Control"), 1980.

Director: AAEA, university, and departmental Outstanding Dissertations Awards (9), 1979 - present.

AAEA Outstanding Journal Article Award Finalist ("Active Learning, Control Theory, and Policy"), 1978.

WAEA Award for Best Published Research ("Firm Growth Policies Under Different Pollution Abatement, Production, and Financial Structures"), 1978.

Faculty Excellence in Teaching Award, Harvard University, 1978.

Associate Editor, *Journal of Economic Dynamics and Control*, 1978 - 1982.

Editorial Board, *American Journal of Agricultural Economics*, 1977 - 1980.

AAEA Award for Best Published Research ("Stochastic Control of Environmental Externalities"), 1976.

Associate Book Review Editor, *Journal of the American Statistical Association*, 1974 - 1982.

Associate Editor, *Journal of the American Statistical Association*, 1973 - 1977.

Commissioned by the American Agricultural Economics Association to prepare a monograph, "Systems Analysis and Simulation Techniques," 1973.

Ford Foundation Visiting Scholar, Argentina, 1972.

Highest Honors, Ph.D. Degree, University of California, Davis, 1971.

Doctoral Dissertation Award for Best Thesis, University of California, Davis, 1971.

Other Awards:

Member of Alpha Zeta; Phi Beta Kappa; Blue Key; National Defense and Education Act Fellowship Grant; Blue Key Award for Outstanding Graduate; Greek Man of the Year Award; Alpha Zeta Alumni Award to the Outstanding Graduating Senior; College Outstanding Leadership Award; Alpha Zeta President; Alpha Gamma Rho President; Agricultural Executive Council President; Senior Class President; Summa Cum Laude.

Listed in:

Who's Who in America
Who's Who Internationally
Who's Who in the West
Who's Who in California
Who's Who in Technology
Who's Who in Finance and Industry
Who's Who in American Colleges and Universities
Who's Who in American Education
American Men and Women of Science
The Directory of Distinguished Americans

Men of Achievement
Personalities of America
Dictionary of International Biography
Community Leaders of the World

ACADEMIC AND GOVERNMENT POSITIONS

UNIVERSITY OF CALIFORNIA, Berkeley, CA.

Dean, College of Natural Resources, 1994 - present.

Chairman, Department of Agricultural and Resource Economics, 1993 - 1994.

Robert Gordon Sproul Distinguished Professor, Department of Agricultural and Resource Economics, 1986 - present.

Chairman, Department of Agricultural and Resource Economics, 1979 - 1985.

Chairman, Executive Committee, Giannini Foundation, 1982 - 1984.

AGENCY FOR INTERNATIONAL DEVELOPMENT, Washington, DC.

Chief Economist, 1988 - 1990.

COUNCIL OF ECONOMIC ADVISORS, Executive Office of the President, Washington, DC.

Special Consultant and Senior Staff Economist, 1986 - 1987.

RESOURCES FOR THE FUTURE, Washington, DC.

Senior Resident Fellow, 1984 - 1985.

VISITING FACULTY APPOINTMENTS

University of Chicago, Chicago, IL, 1972

University of Illinois, 1974.

Hebrew University, 1978 and 1993.

Ben Gurion University, 1980.

Australian National University, 1987.

Monash University, Australia, 1987.

HARVARD UNIVERSITY, Cambridge, MA.

Professor of Managerial Economics and Statistics, 1975 - 1978.

IOWA STATE UNIVERSITY.

Professor of Economics and Statistics, 1974 - 1975.

UNIVERSITY OF CALIFORNIA, Davis, CA.

Full Professor (offered), 1974.

Associate Professor, 1972.

Assistant Professor of Agricultural Economics, 1971.

FIELDS OF INTEREST

Agricultural economics	Industrial organization and antitrust analysis
Applied econometrics	Natural resource and environmental economics
Public policy and economic regulation	Futures markets
Development economics	Statistical decision theory

MEMBERSHIP IN PROFESSIONAL SOCIETIES

American Academy of Arts and Sciences
American Academy of Political and Social Science
American Agricultural Economics Association
American Association for the Advancement of Science
American Economic Association
American Statistical Association
Econometric Society
Institute of Management Science
International Agribusiness Management Association
International Agricultural Economics Association
Mathematical Association of America
Operations Research Society
Western Agricultural Economics Association

PUBLICATIONS

Journal Articles (Refereed)

"The Existence of Broiler Cycles: An Application of Spectral Analysis," with Thomas F. Cargill, *American Journal of Agricultural Economics*, Vol. 52, No. 1, February, 1970, pp. 109-121.

"The Demand for Fertilizer, 1949-1969: An Analysis of Coefficients from Periodic Cross Sections," with T. F. Moriak, *Agricultural Economics Research*, Vol. 22, No. 2, April, 1970, pp. 45-56.

"Effects of Misspecifications of Log-Linear Functions When Sample Values Are Zero or Negative," with S. R. Johnson, *American Journal of Agricultural Economics*, Vol. 53, No. 1, February, 1971, pp. 120-124.

"On the Measurement of Price Elasticity of Demand," with S. H. Logan and R. A. Oliveira, *American Journal of Agricultural Economics*, Vol. 53, No. 1, February, 1971, pp. 112-115.

"Effects of Misspecification of Linear Functions When Sample Values Are Zero or Negative - A Reply," with S. R. Johnson, *American Journal of Agricultural Economics*, Vol. 53, No. 4, November, 1971, pp. 673-674.

"Time and Frequency Domain Representations of Future Prices as a Stochastic Process," with Thomas F. Cargill, *Journal of the American Statistical Association*, Vol. 67, No. 337, March, 1972, pp. 23-30.

"Approximate Distribution of Parameters in Distributed Lag Models," with Theodore P. Lianos, *Journal of the American Statistical Association*, Vol. 67, No. 337, March, 1972, pp. 64-67.

"Learning External Benefits and Subsidies in Water Desalination," with C. Willis and P. Frick, *Water Resources Research*, Vol. 8, No. 6, December, 1972, pp. 1385-1400.

"Investment Sequencing Recognizing Externalities in Water Desalting," with C. Willis, *Water Resource Bulletin*, Vol. 9, No. 1, February, 1973, pp. 54-72.

"The Validity and Verification of Complex System Models," *American Journal of Agricultural Economics*, Vol. 55, No. 2, May, 1973, pp. 273-279.

"Sufficient Conditions for Aggregation in Linear Programming Models," with Quirino Paris, *American Journal of Agricultural Economics*, Vol. 55, No. 4, November, 1973, pp. 177-203.

"Approximate Adaptive Control Solutions to U.S. Beef Trade Policy," with J. W. Freebairn, *Annals of Economic and Social Measurement*, Vol. 3, No. 1, January, 1974, pp. 177-203.

"Updating Parameter Estimates: A Least Squares Approach with an Illustrative Application to the Inventory of Beef Cows," with J. W. Freebairn, *Review of Marketing and Agricultural Economics*, Vol. 42, No. 2, June, 1974, pp. 83-89.

"Alternative Econometric Forms," *Journal of Economics*, Vol. 2, October, 1974, pp. 27-37.

"Estimation of Policy Preference Functions: An Application to U.S. Beef Import Policy," with J. W. Freebairn, *Review of Economics and Statistics*, Vol. 56, No. 4, November, 1974, pp. 437-449.

"An Adaptive Control Approach to Agricultural Policy," with J. W. Freebairn, *Australian Journal of Agricultural Economics*, Vol. 18, No. 3, December, 1974, pp. 208-220.

"Technological Change, Production, and Investment in Natural Resource Industries," *American Economic Review*, Vol. 64, No. 6, December, 1974, pp. 1049-1059.

"Discrete Variations Across Subsets of Parameters in Simultaneous Equation Models," with S. R. Johnson, *Metroeconomica*, Vol. 26, January-December, 1974, pp. 226-244.

"Stochastic Control of Environmental Externalities," with R. Howitt, *Annals of Economic and Social Measurement*, Vol. 4, No. 2, Spring, 1975, pp. 271-292.

"The Limitations of Simulation in Model Evaluation and Decision Analysis," with S. R. Johnson, *Simulation and Games*, Vol. 6, No. 2, June, 1975, pp. 115-150.

"Temporal Price Behavior in Commodity Futures Markets," with T. F. Cargill, *Journal of Finance*, Vol. 30, No. 4, September, 1975, pp. 1043-1053.

"Technical Progress and Environmental Tradeoffs in Natural Resource Industries," *Journal of Economics and Business*, Vol. 28, October, 1975, pp. 1-14.

"Effects and Changes in the Level of U. S. Beef Imports," with J. W. Freebairn, *American Journal of Agricultural Economics*, Vol. 57, No. 4, November, 1975, pp. 676-688.

"Stochastic Control Theory and Economic Policy: An Application," with J. W. Freebairn, *Australian Economic Papers*, Vol. 14, No. 25, December, 1975, pp. 216-230.

"Econometric Policy Model Construction: The Post-Bayesian Approach," with A. Faden, *Annals of Economic and Social Measurement*, Vol. 5, Spring, 1976, pp. 349-362.

"The Stability of the Demand for Money in Canada," with P. Laumas, *Journal of Monetary Economics*, Vol. 2, Summer, 1976, pp. 367-380.

"An Economic Analysis of Wilderness Area Use," with Ronald A. Oliveira, *Journal of the American Statistical Association*, Vol. 71, No. 354, June, 1976, pp. 276-285.

"Investment Sequencing, Allocation, and Learning in the Design of Water Resource Systems: An Empirical Application," with C. Willis, *Water Resources Research*, Vol. 12, June, 1976, pp. 317-330.

"The Economic Impact of EPA Sulfur Standards on the U.S. Coal Industry," with R. A. Levins, M. D. Boehlje, and J. A. Otte, *SME Transactions*, Vol. 262, March, 1977, pp. 65-74.

"Daily Fluctuations in Campground Use: An Economic Analysis," with Ronald A. Oliveira, *American Journal of Agricultural Economics*, Vol. 59, No. 2, May, 1977, pp. 283-293.

"Adaptive Control: Survey of Methods and Applications," with Dov Pekelman, *Management Science*, Vol. 9, 1978, pp. 89-120.

"Active Learning, Control Theory, and Agricultural Policy," *American Journal of Agricultural Economics*, Vol. 60, No. 3, August, 1978, pp. 476-490.

"Public Intervention and Producer Supply Response," with D. Peter Stonehouse, *American Journal of Agricultural Economics*, Vol. 60, No. 5, December, 1978, pp. 885-890.

"Natural Resources, Goods, Bads, and Alternative Institutional Frameworks," with Harvey Lapan, *Resources and Energy*, Vol. 2, No. 4, 1979, pp. 293-324.

"Hedging and Joint Production, Theory and Illustrations," *Journal of Finance*, Vol. 35, No. 2, May, 1980, pp. 448-501.

"A Dynamic Economic Framework for Soil Conservation," *American Journal of Agricultural Economics*, Vol. 62, No. 5, December, 1980, pp. 1093-1094.

"Commodity Price Forecasting with Large-Scale Econometric Models and the Futures Market," with Richard E. Just, *American Journal of Agricultural Economics*, Vol. 63, No. 2, May, 1981, pp. 197-215.

"Multiattribute Utility Analysis: The Case of Filipino Rice Policy," with Joseph Yassour, *American Journal of Agricultural Economics*, Vol. 63, No. 3, August, 1981, pp. 484-494.

"Optimal Choices Among Alternative Technologies with Stochastic Yields," with Josep Yassour and David Zilberman, *American Journal of Agricultural Economics*, Vol. 63, No. 4, November, 1981, pp. 718-723.

"Political Economic Markets: PESTs and PERTs in Food and Agriculture," *American Journal of Agricultural Economics*, Vol. 64, No. 5, December, 1982, pp. 821-833.

"Systems Science and Natural Resource Economics," with Stanley R. Johnson and Cleve Willis, *International Journal of Systems Science*, Vol. 14, No. 8, 1983, pp. 829-858.

"Efficient Asset Portfolios and a Theory of Normal Backwardation," with Colin Carter and Andrew Schmitz, *Journal of Political Economy*, Vol. 91, No. 2, April, 1983, pp. 319-331.

"The Effect of Asymmetrically Held Information and Market Power in Agricultural Markets," with Jeffrey M. Perloff, *American Journal of Agricultural Economics*, Vol. 65, No. 2, May, 1983, pp. 366-371.

"Futures Market Efficiency in the Soybean Complex," with Colin Carter, *Review of Economics and Statistics*, Vol. 65, No. 3, August, 1983, pp. 469-478.

"Country Hedging for Real Income Stabilization: A Case Study of South Korea and Egypt," with Kathryn M. Gordon, *Journal of Futures Markets*, Vol. 4, No. 4, Winter, 1984, pp. 449-464.

"The Distributional Effects of Land Controls in Agriculture," with David Zilberman and Richard E. Just, *Western Journal of Agricultural Economics*, Vol. 9, No. 2, December, 1984, pp. 215-232.

"Some Political Economy Aspects of Macroeconomic Linkages with Agriculture," with Margaret S. Andrews, *American Journal of Agricultural Economics*, Vol. 68, No. 2, May, 1986, pp. 413-417.

"Macroeconomic Linkages, Taxes, and Subsidies in the U.S. Agricultural Sector," with James A. Chalfant, H. Alan Love, and Kostas G. Stamoulis, *American Journal of Agricultural Economics*, Vol. 68, No. 2, May, 1986, pp. 399-412.

"Modeling the Effects of Policy on Farmers in Developing Agriculture," with Richard E. Just and David Zilberman, *International Journal of Development Planning Literature*, Vol. 1, No. 3, July-September, 1986, pp. 287-300.

"Managing Farm Supply: Kick the Habit; But Make Other Reforms, Too," with William E. Foster, *Choices*, 3rd Quarter, 1987, pp. 18-21.

"The Political Economy of Agricultural Policy Reform," with Douglas A. Irwin, *European Review of Agricultural Economics*, 1989, pp. 349-366.

"Interest Rates and Commodity Prices," with John Kitchen, *Journal of Agricultural Economics Research*, Vol. 41, No. 2, Spring, 1989, pp. 5-11.

"Incomplete Markets and Government Agricultural Policy," with Robert D. Innes, *American Journal of Agricultural Economics*, Vol. 71, No. 4, November, 1989, pp. 915-931.

"An Assessment of the Agricultural Economics Profession," with Richard E. Just, *American Journal of Agricultural Economics*, Vol. 1, No. 5, December, 1989, pp. 1177-1190.

"Looking Ahead: Agricultural Policy in the 1990s," with David Nielson, *U. C. Davis Law Review*, Vol. 12, No. 3, Spring, 1990, pp. 415-430.

"A New Paradigm for Policy Reform and Economic Development," *American Journal of Agricultural Economics*, Vol. 72, No. 3, August, 1990, pp. 821-826.

"Political Preference Functions and Public Policy Reform," with William E. Foster, *American Journal of Agricultural Economics*, Vol. 72, No. 3, August, 1990, pp. 642-652.

"Linkages Among Commodity Futures Markets and Dynamic Welfare Analysis," with Nicholas Walraven, *Review of Economics and Statistics*, Vol. 72, No. 4, November, 1990, pp. 631-639.

"Market Politics and Foreign Assistance," with Scott Thomas, *Development Policy Review*, Vol. 8, December, 1990, pp. 365-381.

"Implications of Structural Adjustment: Experience in Developing World for Eastern Europe," *American Journal of Agricultural Economics*, Vol. 72, No. 5, December, 1990, pp. 1252-1256.

"Farmer Behavior Under Risk of Failure," with William E. Foster, *American Journal of Agricultural Economics*, Vol. 73, No. 2, May, 1991, pp. 276-288.

"The Political Economy of Commodity and Public Good Policies in Agriculture: Implications for Policy Reform," with Harry de Gorter, *European Review of Agricultural Economics*, Vol. 18, 1991, pp. 481-504.

"Food Security, Price Uncertainty, and Country Hedging: A Case Study of China," with Jianmin Liu, *The Review of Futures Markets*, Vol. 10, No. 2, 1991, pp. 357-371.

"Preconditions for the Emergence of East European Market Economies," *Current Politics and Economics of Europe*, Vol. 1, No. 3-4, 1991, pp. 347-361.

"Productive and Predatory Public Policies: Research Expenditures and Producer Subsidies in Agriculture," with Harry de Gorter and David J. Nielson, *American Journal of Agricultural Economics*, Vol. 74, No. 1, February, 1992, pp. 27-37.

"Political Preference Functions and Public Policy Reform: A Reply," with William E. Foster, *American Journal of Agricultural Economics*, Vol. 74, No. 1, February, 1992, pp. 227-230.

"Public Policy: Explanation and Constitutional Prescription," with Pinhas Zusman, *American Journal of Agricultural Economics*, Vol. 74, No. 2, May, 1992, pp. 247-257.

"Predatory Versus Productive Governments: The Case of U. S. Agricultural Policy," *Journal of Economic Perspectives*, Vol. 6, No. 3, Summer, 1992, pp. 133-157.

"Environmental and Agricultural Policy Linkages and Reforms in the United States Under the GATT," with Richard Just, *American Journal of Agricultural Economics*, Vol. 74, No. 3, August, 1992, pp. 766-774.

"State-Market-Civil Institutions: The Case of Eastern Europe," with S.R. Johnson, *World Development*, Vol. 21, No. 4, April, 1993, pp. 675-689.

"Price Distorting Compensation Serving the Consumer and Taxpayer Interest," with William E. Foster, *Public Choice*, Vol. 77, No. 2, October, 1993, pp. 275-291.

"The Governance Structure of Agricultural Science and Agricultural Economics: A Call to Arms," with Richard E. Just, *American Journal of Agricultural Economics*, Vol. 75, October, 1993, pp. 69-83.

"Nutrient Demand and the Allocation of Time: Evidence from Guam," with Glynis Gawn, Robert Innes, and David Zilberman, *Applied Economics*, Vol. 25, 1993, pp. 811-830.

"Natural Resource Damages: Knowledge of Valuation Techniques Useful, as Liability Exposure Grows," with André Fargeix, *Environmental Compliance and Litigation Strategy*, Vol. 9, No. 8, January, 1994.

"Intraorganizational Influence Relations and the Optimality of Collective Action," with Pinhas Zusman, *Journal of Economic Behavior and Organization*, Vol. 24, No. 1, June, 1994, pp. 1-22.

"Government Agricultural Policy, the United States," *The Encyclopedia of Agricultural Sciences*, Charles J. Arntzen (ed.), Academic Press, San Diego, CA, Vol. 2, 1994, pp. 465-476.

"Governance Structures and the Durability of Reforms: Evidence from Inflation Stabilizations," with Richard Ball, *World Development*, Vol. 23, No. 6, 1995, pp. 897-912.

"Flexible Technology and the Cost of Improving Groundwater Quality," with David Sunding, David Zilberman, and Alan Marco, *Natural Resources Modeling*, Vol. 9, No. 2, Spring, 1995, pp. 177-192.

"USA: The Tomato Processing Industry Outlook," with André C. Fargeix, *Tomato News*, World Information Center for the Processing Tomato Industry, Mediterranean International Association of the Processing Tomato, Avignon, France, February, 1996, pp. 6-14.

"Modeling Multilateral Negotiations: An Application to Water Policy," with Gregory D. Adams and Leo K. Simon, *Journal of Economic Behavior and Organization*, Volume 30, No. 1, June, 1996.

"Flexible Public Policy: The Case of the U.S. Wheat Sector," with H. Alan Love, *Journal of Policy Modeling*, Vol. 19, No. 2, April, 1997, pp. 207-236.

"Regulating Multiple Polluters: Deterrence and Liability Allocation," with Charles Hyde and Leo Simon, *International Economic Review*, forthcoming.

"Information Asymmetries, Uncertainties, and Cleanup Delays at Superfund Sites," with Leo Simon and Jinhua Zhao, *Journal of Environmental Economics and Management*, forthcoming.

"Central European Agricultural Policy and the EU," with Rachel Goodhue and Jill McCluskey, *Current Politics and Economics of Europe*, accepted for publication.

"An Economic Evaluation of *BWI Custom Kitchens* and Indirect Purchaser Classes in Horizontal Price Fixing Cases," with Gregory D. Adams, *Competition*, forthcoming.

Papers Submitted for Refereed Journal Publication

"Bio Prospecting with Prior Ecological Information," with Arthur Small, to be submitted to the *American Economic Review*.

"The Role of Taxes and Zoning in the Effective Control of Pollution," with Oded Hochman, *Journal of Environmental Economics and Management*.

"A Noncooperative Model of Collective Decision Making: A Multilateral Bargaining Approach," with Leo K. Simon, *Econometrica*.

"Federal Grazing Reform and Avoidable Risk," with Jill McCluskey, *American Journal of Agricultural Economics*.

"The Political Economics of Alliances: Structure and Performance," with Leo K. Simon, *American Political Science Review*.

"Political Preference Functions: Theory and Measurement," with Jill McCluskey, to be submitted to *American Journal of Agricultural Economics*.

"Environmental Activism and the Public Good," with Jill J. McCluskey, *American Economic Review*.

"Putty-Clay Politics in Transition Economies," with Robert Lyons and Leo Simon, *Economics and Politics*.

"Alternative Trade and Support Strategies for CAP Integration," with Arthur Small, *Agricultural Economics*.

"Privatization, Market Liberalization and Learning in Transition," with Rachel Goodhue and Leo Simon, *American Journal of Agricultural Economics*.

Books and Monographs

A Survey of Agricultural Economics Literature: Quantitative Methods, with G. G. Judge, R. Day, S. R. Johnson, and Lee Martin, University of Minnesota Press, Minneapolis, MN, 1977, 473p.

Urban Malnutrition: Problem Assessment and Intervention Guidelines, with J. Austin, Johanna Dwyer, et al., World Bank Monograph, 1977.

Dynamics of Agricultural Systems: Economic Prediction and Control, with E. Hochman, North-Holland Publishing Co., Amsterdam, 1979, 364p.

New Directions in Econometric Modeling and Forecasting in U. S. Agriculture, Gordon C. Rausser (ed.), Elsevier North-Holland, Inc., New York, NY, 1982.

Alternative Agricultural and Food Policies and the 1985 Farm Bill, Gordon C. Rausser and Kenneth R. Farrell (eds.), Giannini Foundation of Agricultural Economics, University of California, Berkeley, CA; and Resources for the Future, Washington, DC, Blaco Publishers, San Leandro, CA, 1984.

Macroeconomic Environment for U.S. Agricultural Policy, American Enterprise Institute for Public Policy Research, Occasional Paper on U.S. Agricultural Policy, Washington, DC; 1985.

"Toward Agricultural Policy Reform," *Economic Report of the President*, U.S. Council of Economic Advisors, 1987, Chapter 5, pp. 147-178.

Development and the National Interest (one of many collaborators), Agency for International Development Monograph, March, 1989.

The Emergence of Market Economies in Eastern Europe, Gordon C. Rausser and C. Clague (eds.), Blackwell Publishers, Cambridge, MA, 1992.

Economic Growth, Political and Civil Liberties, with John McMillan and Stanley R. Johnson, Occasional Paper, No. 53, Institute for Contemporary Studies, San Francisco, 1994.

GATT Negotiations and the Political Economy of Policy Reform, with associates, Springer-Verlag, Berlin, Heidelberg, New York, 1995.

Political Power and Endogenous Policy Formation, with P. Zuzman, University of Cambridge Press, in progress.

Chapters in Books and Proceeding Issues of Journals

"A Time Series Analysis of the U.S. Hog Industry," *Western Agricultural Economics Association Proceedings*, July, 1969.

"Futures Price Behavior as a Stochastic Process," with T. F. Cargill, *American Statistical Association Proceedings*, Business and Economic Statistics Section, August, 1969.

"A General Framework for Aggregation in Linear Programming Models," with Quirino Paris, *Western Agricultural Economics Association Proceedings*, July, 1970.

"Forecasting Weekly Lemon Prices by a Distributed Lag Model with Fourier Transform Methods," with Dean Chen, *American Statistical Association Proceedings*, Business and Economic Statistics Section, December, 1970.

"An Appendix on Water Resource Decision Making Under Conditions of Uncertainty," with G. W. Dean, *California Water: A Study in Resource Management*, D. Seckler (ed.), University of California Press, Berkeley, CA, 1971, pp. 310-344.

"Uncertainty and Decision-Making in Water Resources," with G. W. Dean, *California Water: A Study in Resource Management*, D. Seckler (ed.), University of California Press, Berkeley, CA, 1971, Chapter 12, pp. 233-250.

"Normalization Rules, Approximate Small Sample Properties and the TSLS Estimator," with S. R. Johnson, *American Statistical Association Proceedings*, Business and Economic Statistics Section, December, 1972, pp. 420-425.

Book Review of *The Computation of General Equilibria* (by Herbert Scarf), with Quirino Paris, *Journal of the American Statistical Association*, Vol. 70, No. 350, June, 1975, pp. 485-486.

"An Estimating Method for Models with Stochastic, Time Varying Parameters," with S. R. Johnson, *American Statistical Association Proceedings*, Business and Economic Statistics Section, September, 1975, pp. 356-361.

"Economic Forecasting: The Case of Australian Agriculture," with J. W. Freebairn, *American Statistical Association Proceedings*, Business and Economic Section, September, 1976, pp. 542-548.

"Environmental Impacts on Electricity Systems Growth," with A. S. Cohen and G. Fishelson, *Environmental Pollutants and the Urban Economy*, G. S. Tolley and A. S. Cohen (eds.), University of Chicago, Center for Urban Studies, Chicago, IL, 1976.

"Environmental Policies for Power Plants," with G. Fishelson and A. S. Cohen, *Environmental Pollutants and the Urban Economy*, G. S. Tolley and A. S. Cohen (eds.), University of Chicago, Center for Urban Studies, Chicago, IL, 1976.

"Firm Growth Policies Under Different Pollution Abatement, Production, and Financial Structures," with E. Hochman, *Economic Growth of the Agricultural Firm*, C. Baker and R. Barry (eds.), Washington State University Press, WRCC-16 Research Committee, 1977, Chapter 12.

"A Survey of Systems Analysis and Simulation in Agricultural Economics," with S. R. Johnson, *Quantitative Methods in Agricultural Economics, 1940s to 1970s*, G. G. Judge et al. (eds.), University of Minnesota Press, Minneapolis, MN, 1977, Chapter 3, pp. 156-301.

"Models of the U.S. Corn System." *Agribusiness Management for Developing Countries—Southeast Asia Corn Systems*, R. A. Goldberg et al. (eds.), Ballinger Publishing Co., Boston, MA, 1979, pp. 576-626.

"Futures versus Commercial Econometric Models," with Richard E. Just, *Futures Trading Seminar*, Anne Peck (ed.), Vol. 6. Board of Trade of the City of Chicago, Chicago, IL, 1980.

"Prospects and Limitations of Operations Research Applications in Agriculture and Agricultural Policy," with Richard E. Just and David Zilberman, *Operations Research in Agriculture and Water Resources*, Dan Yaron and Charles Tapiero (eds.), North-Holland Publishing Co., Amsterdam, 1980, Chapter 2, pp. 17-40.

"The Israeli Poultry Marketing Board: Price Production and Inventory Controls," with Eithan Hochman and Eliahu Comay, *Applied Stochastic Control in Econometrics and Management Science*, A. Bensoussan, P. Kliendorfer, and C. S. Tapiero (eds.), North-Holland Publishing Co., Amsterdam, 1980, Chapter 1, pp. 1-38.

"A Putty-Clay Approach to the Distributional Effects of New Technology Under Risk," with Richard E. Just and David Zilberman, *Operations Research in Agriculture and Water Resources*, Dan Yaron and Charles Tapiero (eds.), North-Holland Publishing Co., Amsterdam, 1980, Chapter 6, pp. 97-121.

"Policy: Alternatives and Consequences of Conservation Technology on Agricultural Land," *Soil and Water Resources: Research Priorities for the Nation*, W. E. Larsen, L. M. Walsh, B. A. Stewart, and Don H. Boelter (eds.), Soil Science Society of America, Madison, WI, 1981, pp. 83-102.

"Principal Issues in the Evaluation of Public Research in Agriculture," with Alain de Janvry, Andrew Schmitz, and David Zilberman, *Methodology for Evaluation of Agriculture Research*, Walter L. Fisher, G. W. Norton, A. Paulsen, and W. Burt Sunkvist (eds.), University of Minnesota, Agricultural Experiment Station, Minneapolis, MN, 1981, Miscellaneous Publication No. 8.

"Food Grain Policy in Bangladesh," *Planning and Decision in Agribusiness: Principles and Experiences*, C. H. Hanf and G. W. Schiefer (eds.), Elsevier Scientific Publishing Company, New York, NY, 1982, pp. 241-262.

"New Conceptual Developments and Measurements for Modeling the U.S. Agricultural Sector," *New Directions in Econometric Modeling and Forecasting in U.S. Agriculture*, Gordon C. Rausser (ed.), Elsevier North-Holland, Inc., New York, NY, 1982, Chapter 1.

"Simple Quantitative Models for Integrative Planning Frameworks," *Planning and Decision in Agribusiness: Principles and Experiences*, C. H. Hanf and G. W. Schiefer (eds.), Elsevier Scientific Publishing Company, New York, NY, 1982, pp. 335-369.

"Consumer Demand, Grades, Brands, and Margin Relationships," with Peter Berck, *New Directions in Econometric Modeling and Forecasting in U.S. Agriculture*, Gordon C. Rausser (ed.), Elsevier North-Holland, Inc., New York, NY, 1982, Chapter 4.

"Food and Agriculture Sector Linkages to the International and Domestic Macroeconomies," with John W. Freebairn and Harry de Gorter, *New Directions in Econometric Modeling and Forecasting in U.S. Agriculture*, Gordon C. Rausser (ed.), Elsevier North-Holland, Inc., New York, NY, 1982, Chapter 17.

"Composite Forecasting in Commodity Systems," with Stanley R. Johnson, *New Directions in Econometric Modeling and Forecasting in U.S. Agriculture*, Gordon C. Rausser (ed.), Elsevier North-Holland, Inc., New York, NY, 1982, Chapter 21.

"Institutionalizing a Large Scale Econometric Model: The Case of Agricultural Canada," with Stanley R. Johnson and Bruce Huff, *New Directions in Econometric Modeling and Forecasting in U.S. Agriculture*, Gordon C. Rausser (ed.), Elsevier North-Holland, Inc., New York, NY, 1982, Chapter 23.

"Principles of Policy Modeling in Agriculture," with Richard E. Just, *Modeling Agriculture for Policy Analysis in the 1980s*, Federal Reserve Bank of Kansas City, Kansas City, September, 1981, pp. 139-174. Also in *New Directions in Econometric Modeling and Forecasting in U.S. Agriculture*, Elsevier North-Holland, Inc., New York, NY, 1982, pp. 763-800.

"Developments in Theory and Empirical Applications of Endogenous Governmental Behavior," with Erik Lichtenberg and Ralph Lattimore, *New Directions in Econometric Modeling and Forecasting in U.S. Agriculture*, Gordon C. Rausser (ed.), Elsevier North-Holland, Inc., New York, NY, 1982, Chapter 18.

"Structural Change, Updating, and Forecasting," with Yair Mundlak and Stanley R. Johnson, *New Directions in Econometric Modeling and Forecasting in U.S. Agriculture*, Gordon C. Rausser (ed.), Elsevier North-Holland, Inc., New York, NY, 1982, Chapter 20.

"Price Supports and Demand in Commodity Market Modeling," with Chris Riboud, *New Directions in Econometric Modeling and Forecasting in U.S. Agriculture*, Gordon C. Rausser (ed.), Elsevier North-Holland, Inc., New York, NY, 1982, Chapter 11.

"The Distributional Impacts of Agricultural Programs," with David Zilberman and Richard E. Just, *Proceedings from Perspectives on Food and Agricultural Policy Research Workshop*, The Farm Foundation, Oak Brook, IL, 1982, pp. 33-60.

"Lead-Lag Price Relationships Between Thinly and Heavily Traded Commodity Futures Markets," with Colin A. Carter, *Applied Commodity Price Analysis, Forecasting, and Market Risk Management: Proceedings of the NCR-134 Conference, Des Moines, Iowa, 1983*, Iowa State University, Department of Agricultural Economics, Ames, IA, 1983, pp. 241-251.

"Commodity Price Forecasting with Large-Scale Econometric Models and the Futures Market." Reprinted in *Readings and Futures Markets, Vol. IV: Selected Writings on Futures Markets: Research Directions in Commodity Markets, 1970-1982*, Chicago Board of Trade, 1983.

"Expectation and Intertemporal Pricing in Commodity Futures and Spot Markets," with Richard E. Just, *Applied Commodity Price Analysis, Forecasting, and Market Risk Management: Proceedings of the NCR-134 Conference, Des Moines, Iowa, 1983*, Iowa State University, Department of Agricultural Economics, Ames, IA, 1983, pp. 252-279.

"Modeling Equity and Efficiency in Agricultural Production Systems," with Richard E. Just and David Zilberman, *Growth and Equity in Agricultural Development: Proceedings, 18th International Conference of Agricultural Economics, Jakarta, Indonesia, 1982*, A. Maunier and K. Ohkawa (eds.), Gower, Aldershot, 1983; and Oxford University Press, Oxford, 1983, pp. 120-135.

"Implications of United States Experience for Water Resource Planning in Egypt," with Margriet F. Caswell, *The Economic Challenges of Peace: Agriculture and Economic Transition in Egypt*, Proceedings of a Conference, Alexandria, Egypt, 1980, S. R. Johnson, John R. Moore, and Martin Wannan (eds.), University of Missouri, Department of Agricultural Economics, Columbia, MO, 1983, pp. 48-64.

"A Proper Perspective for Considering Adaptive Economics," with David Zilberman, *Modeling Farm Decisions for Policy Analysis*, Kenneth H. Baum and Lyle P. Schertz (eds.), Westview Press, Boulder, CO, 1983, pp. 56-60.

Agricultural Policy: A Synthesis of Major Studies and Options for 1985, with William E. Foster, National Conference on Food, Agriculture, and Resources, Resources for the Future, Washington, DC, 1984, 120p.

"Review and Assessment of Alternative Agricultural Policy Proposals," with Linda S. Calvin and William E. Foster, *Alternative Agricultural and Food Policies and the 1985 Farm Bill*, Gordon C. Rausser and Kenneth R. Farrell (eds.), Giannini Foundation of Agricultural Economics, University of California, Berkeley, CA; and Resources for the Future, Washington, DC, Blaco Publishers, San Leandro, CA, 1984, Chapter 7, pp. 143-182.

"Summary and Conclusions," with Kenneth R. Farrell, *Alternative Agricultural and Food Policies and the 1985 Farm Bill*, Gordon C. Rausser and Kenneth R. Farrell (eds.), Giannini Foundation of Agricultural Economics, University of California, Berkeley, CA; and Resources for the Future, Washington, DC, Blaco Publishers, San Leandro, CA, 1984, Chapter 1, pp. 1-8.

"Monetary Policy and U. S. Agriculture," with John W. Freebairn and Harry de Gorter, *International Agricultural Trade: Advanced Readings in Price Formation, Market Structure, and Price Instability*, Andrew Schmitz, and Alexander H. Sarris (eds.), Westview Press, Boulder, CO, 1984, pp. 99-123.

"Uncertain Economic Environments and Conditional Policies," with Richard E. Just, *Alternative Agricultural and Food Policies and the 1985 Farm Bill*, Gordon C. Rausser and Kenneth R. Farrell

(eds.), Giannini Foundation of Agricultural Economics, University of California, Berkeley, CA; and Resources for the Future, Washington, DC, Blaco Publishers, San Leandro, CA, 1984, Chapter 5, pp. 101-132.

"Macroeconomics and U.S. Agricultural Policy," *U.S. Agricultural Policy: 1985 Farm Legislation*, Bruce L. Gardner (ed.), American Enterprise Institute for Public Policy Research, Washington, DC, 1985, pp. 207-252.

"A Synthesis of Major Studies and Options for 1984," with William E. Foster, *The Dilemmas of Choice*, Kent A. Price (ed.), The National Center for Food and Agricultural Policy: Resources for the Future, 1985, Chapter 7, pp. 201-246.

"Instability in Agricultural Markets: The U.S. Experience," with James A. Chalfant and Kostas G. Stamoulis, *Agriculture in a Turbulent World*, A. Maunier and U. Renborg (eds.), Oxford University Press, Oxford, 1985, Chapter 6, pp. 595-604.

"Modeling Alternative Trade and Macroeconomic Scenarios: Implications for U. S. Agriculture," with Kostas G. Stamoulis, H. Alan Love, and James A. Chalfant, *Impacts of Farm Policy and Technological Change on U. S. and California Agriculture*, Harold O. Carter (ed.), University of California, Agricultural Issues Center, Davis, CA, 1986, pp. 91-136.

"The Food Marketing System: The Relevance of Economic Efficiency Measures," with Jeffrey M. Perloff and Pinhas Zusman, *Economic Efficiency in Agricultural and Food Marketing*, Richard L. Kilmer and Walter J. Armbruster (eds.), Iowa State University Press, Ames, IA, 1987, Chapter 1, pp. 3-31.

"Developments in Economics of Importance to Agricultural Economics: A Discussion," *Agriculture and Rural Areas Approaching the 21st Century*, R. J. Hildreth et al. (eds.), Iowa State University Press, Ames, IA, 1988, pp. 257-264.

"The Macroeconomics of Agriculture in Rural America," *Agriculture and Rural Areas Approaching the 21st Century*, R. J. Hildreth et al. (eds.), Iowa State University Press, Ames, IA, 1988, pp. 384-395.

"Stability Issues and Policy Analysis," *Agricultural Stability and Farm Programs*, Dan Sumner (eds.), Westview Press, Boulder, CO, February, 1988, pp. 143-170.

"Overshooting of Agricultural Prices," with Kostas G. Stamoulis, *Macroeconomics, Agriculture, and Exchange Rates*, Robert G. Chambers and P. L. Paarlberg (eds.), International Agricultural Trade Research Consortium, Westview Press, Boulder, CO, 1988, pp. 163-189.

"A Coherent Policy for U.S. Agriculture," with William E. Foster, *Food, Policy, and Politics: A Perspective on Agriculture and Development*, George Horwich and Gerald J. Lynch (eds.), Westview Press, Boulder, CO, 1989, pp. 191-237.

"Alternative Strategies for Trade Policy Reform," with Brian D. Wright, *Policy Coordination in World Agriculture*, Harald von Witzke, C. Ford Runge, and Brian Job (eds.), University of Minnesota Press, Minneapolis, MN, 1989, pp. 117-159.

"The Impacts of Economic Reform for Agricultural and Food Policy," with William E. Foster, *World Food System: Hunger in the Midst of Plenty*, Volume I, John W. Helmuth and Stanley R. Johnson (eds.), Iowa State University Press, Ames, IA, 1989, pp. 95-99.

"The Macroeconomic Dimension of Agricultural and Food Policy Reform," *World Food System: Hunger in the Midst of Plenty*, Volume II, John W. Helmuth and Stanley R. Johnson, Iowa State University Press, Ames, IA, 1989, pp. 90-109.

"Endogenizing Policy in Models of Agricultural Markets," with Harry de Gorter, *Agriculture and Governments in an Interdependent World*, Allen Maunier and Alberto Valdés (eds.), Proceedings of the Twentieth International Conference of Agricultural Economists, Buenos Aires, August, 1988; International Association of Agricultural Economists, University of Oxford, 1989, pp. 259-274.

"Dynamic Welfare Analysis and Commodity Futures Markets Overshooting," with Nicholas Walraven, *International Commodity Market Modeling: Advances in Methodology and Applications*, O. Guvenen, W.C. Labys, and J.B. Lesourd (eds.), Chapman and Hall Book Publishing Co., 1991, Chapter 11, pp. 211-232.

"World Commodity Prices: The Role of External Debt and Industrial Country Policies," with M.G. Rose and D.A. Irwin, *Agricultural Trade Liberalization*, Ian Goldin and Odin Knudsen (eds.), Organization for Economic Cooperation and Development, Paris; and The World Bank, Washington, DC, 1990, Chapter 15, pp. 415-445.

"The Politics of Economic Policy Reform," with E. Scott Thomas, *Development Issues, 1990*, Ronald Roskens (ed.), Chairman of Development Coordination Committee, U.S. Government Printing Office, Washington, DC, 1990, pp. 4-19, Chapter 2.

"Empirical Pricing Measures for Futures Markets," with Nicholas Walraven, *Commodity Futures and Financial Markets*, Louis Philips (ed.), Kluwer Academic Publishers, Norwell, MA, 1990, pp. 179-203, Chapter 7.

"The Evolution and Coordination of U. S. Commodity and Resource Policies," with William E. Foster, *Commodity and Resource Policies in Agricultural Systems*, Richard E. Just and Nancy Bockstael (eds.), Springer-Verlag, Berlin, Heidelberg, New York, 1991, pp. 17-45.

"Organizational Failure and the Political Economy of Water Resources Management," with Pinhas Zusman, *The Economics and Management of Water and Drainage in Agriculture*, Ariel Dinar and David Zilberman (eds.), Kluwer Publishers, Boston, MA, 1991, pp. 735-758, Chapter 37.

"Public Research in Agriculture: An Alternative Institutional Framework," with David Zilberman, *Economic Models, Estimation, and Socioeconomic Systems: Essays in Honor of Karl Fox*, Tej K. Kaul and Jati K. Sengupta (eds.), Elsevier Science Publishers, Amsterdam, 1991, pp. 33-53.

"The Political Economy of Agriculture in the United States," *The Political Economy of North America Agricultural Policies and Trade*, Hans Michelmann, Jack Stabler, and Gary Storey, (eds.), Westview Press, Boulder, CO, 1991, pp. 57-91, Chapter 3.

"An Assessment of the Agricultural Economics Profession," *Social Science Agricultural Agendas and Strategies*, J. Loehr (ed.), Michigan State University Press, East Lansing, 1991.

"The Political Economy of Transition in Eastern Europe: Packaging Enterprises for Privatization," with Leo Simon, *The Emergence of Market Economies in Eastern Europe*, Christopher Clague and Gordon Rausser (eds.), Blackwell Publishers, Cambridge, MA, 1992, Chapter 14.

"Lessons for Emerging Market Economies in Eastern Europe," *The Emergence of Market Economies in Eastern Europe*, Christopher Clague and Gordon Rausser (eds.), Blackwell Publishers, Cambridge, MA, 1992, Chapter 19.

"Environmental and Agricultural Policy Linkages and Reforms in the United States under the GATT," with Richard Just and David Zilberman, *Improving Agricultural Trade Performance under the GATT*, T. Becker, R. Gray, and A. Schmitz (eds.), Wissenschaftsverlag Vauk Kiel K.G., 1992, Chapter 18.

"The Structure of Research and Transfer Policies in International Agriculture, with David R. Lee, *Issues in Agricultural Development, Sustainability and Cooperation*, Margot Bellamy and Bruce Greenshields (eds.), International Association of Agricultural Economists Occasional Paper No. 6, 1992, pp. 34-42.

"Modeling the Effects of Policy on Farmers in Developing Agriculture," with Richard E. Just and David Zilberman. Chapter published in *Theoretical Foundations of Development Planning*, S.B. Dahiya (ed.), foreword by Professor Jan Tinbergen, Nobel Laureate, Vedams Books International, Concept Publishing Company, Delhi, India, 1992. [Originally appeared in *International Journal of Development Planning Literature* Vol. 1, No. 3, July-September 1986, pp. 287-300.]

"An Emerging Framework for Economic Development: A LDC Perspective," *Industrial Policy for Agriculture in the Global Economy*, S.R. Johnson and S.A. Martin (eds.), Iowa State University Press, Ames, IA, 1993, Chapter 11, pp. 229-245.

"The Uruguay Round and the GATT Negotiations," *GATT Negotiations and the Political Economy of Policy Reform*, Gordon C. Rausser (ed.), Springer-Verlag, Berlin, Heidelberg, New York, 1995, Chapter 1, pp. 1-34.

"Compensation and Political Feasibility: Facilitating Welfare Improving Policies," with Richard E. Just and David Zilberman, *GATT Negotiations and the Political Economy of Policy Reform*, Gordon C. Rausser (ed.), Springer-Verlag, Berlin, Heidelberg, New York, 1993, Chapter 3, pp. 65-84.

"Managing Groundwater Quality Under Uncertainty," with David Sunding, David Zilberman and Alan Marco, *Quantifying Long-Run Risks in Agriculture*, Michele Marra (ed.), proceedings of a seminar sponsored by Southern Regional Project S-232, Jekyll Island, GA, March 1993. Department of Resource Economics and Policy, University of Maine, Orono, ME, June 1993, pp. 1-33.

"The Political Economy of Redistributive Policies and the Provision of Public Goods in Agriculture," with Harry de Gorter and David J. Nielson, *GATT Negotiations and the Political Economy of Policy Reform*, Gordon C. Rausser (ed.), Springer-Verlag, Berlin, Heidelberg, New York, 1995, Chapter 4, pp. 85-106.

"Coalition Breaking and Policy Reform," with William E. Foster, *GATT Negotiations and the Political Economy of Policy Reform*, Gordon C. Rausser (ed.), Springer-Verlag, Berlin, Heidelberg, New York, 1995, Chapter 5, pp. 107-124.

"Public Goods and Welfare Transfer Tradeoffs," with William E. Foster, *GATT Negotiations and the Political Economy of Policy Reform*, Gordon C. Rausser (ed.), Springer-Verlag, Berlin, Heidelberg, New York, 1995, Chapter 6, pp. 125-143.

"Mobility, Diversification and Sustainability of Trade Reform," with William E. Foster and Richard Gray, *GATT Negotiations and the Political Economy of Policy Reform*, Gordon C. Rausser (ed.), Springer-Verlag, Berlin, Heidelberg, New York, 1995, Chapter 7, pp. 145-164.

"Modeling Policy Reform in the U.S. Wheat and Feed Grain Sectors," with Richard E. Just and David Zilberman, *GATT Negotiations and the Political Economy of Policy Reform*, Gordon C. Rausser (ed.), Springer-Verlag, Berlin, Heidelberg, New York, 1995, Chapter 8, pp. 175-254.

"The Determination of Technology and Commodity Policy in the U.S. Dairy Industry," with Harry de Gorter and David Nielson, *GATT Negotiations and the Political Economy of Policy Reform*, Gordon C. Rausser (ed.), Springer-Verlag, Berlin, Heidelberg, New York, 1995, Chapter 9, pp. 253-274.

"Modeling Phased Reductions of Distortionary Policies in the U.S. Wheat Market under Alternative Macroeconomic Environments," with Steve Labson, *GATT Negotiations and the Political Economy of Policy Reform*, Gordon C. Rausser (ed.), Springer-Verlag, Berlin, Heidelberg, New York, 1995, Chapter 10, pp. 275-314.

"Alternative Subsidy Reduction Paths: The Role of Fiscal and Monetary Policy Linkages," with Pier-Giorgio Ardeni, *GATT Negotiations and the Political Economy of Policy Reform*, Gordon C. Rausser (ed.), Springer-Verlag, Berlin, Heidelberg, New York, 1995, Chapter 11, pp. 315-345.

"State-Market-Civil Institutions: The Case of Eastern Europe and the Soviet Republics," with Stanley R. Johnson, *State, Market, and Civil Organizations*, Alain de Janvry, Samir Radwan, Elisabeth Sadoulet and Erik Thorbecke (eds.), MacMillan Press, London, 1995, pp. 458-486.

"Productive and Predatory Publication Policies: Research Expenditures and Producer Subsidies in Agriculture," G.H. Peters (ed.), reprinted in *Agricultural Economics*, Edward Elgar Publishing Ltd., Cheltenham, England, 1994.

"Disruption and Continuity in Bulgarian Agrarian Reform," with R.F. Lyons and L.K. Simon, *Privatization of Agriculture in New Market Economies: Lessons from Bulgaria*, A. Schmitz, K. Molton, A. Buckwell and S. Davidola (eds.), Kluwer Academic Press, Boston, 1994, Chapter 5.

"Political Economic Processes and Collective Decision Making," with Leo K. Simon and Klaas T. van't Veld, *Proceedings of the XXII International Conference of Agricultural Economists*, Harare, Zimbabwe, August 22-30, 1994, International Association of Agricultural Economists, 1994.

"Incentive Structures for Allocating Public Research Resources," with Robert Lyons and Leo Simon, *Invited paper in the Proceedings of the Conference, Global Agricultural Science Policy for the Twenty-First Century*, Melbourne, Australia, August 16-18, 1996.

"The Choice of Commodity Policies and Research Investment in Agriculture," with Johann F.M. Swinnen and Harry de Gorter, Contributed paper in the Proceedings of the Conference, Global Agricultural Science Policy for the Twenty-First Century, Melbourne, Australia, August 16-18, 1996.

"Deriving Biodiversity Option Value Within a Model of Biotechnology Research and Development," with Arthur A. Small, Paper in the Proceedings of the Conference, 1997 Workshop on Valuation and Environmental Policy, Arlington, VA, April 7-8, 1997.

Commissioned Papers, Governmental Reports, and Working Papers

"A Dynamic Econometric Model of the California-Arizona Orange Industry," unpublished Ph.D. dissertation, University of California, Davis, CA, 1971.

"Learning, Production, and Investment in Natural Resource Industries," University of Chicago, Center for Mathematical Studies in Business and Economics, Report No. 7336, Chicago, IL, 1973.

"Approximate Adaptive Control Solutions to the U.S. Beef Trade Policy Problem," with J. W. Freebairn, University of Chicago, Center for Mathematical Studies in Business and Economics, Report No. 7337, Chicago, IL, 1973.

"Enforcement, Transaction Costs, and Monitoring of Pollution," with G. Fishelson, University of Chicago, Urban Economic Report, Chicago, IL, 1974.

"Taxes as Solutions to Externalities," with R. Zerbe, University of Chicago, Urban Economics Report, Chicago, IL, 1974.

"Environmental Effects of Altering the Existing Commonwealth Edison System," with G. Fishelson, University of Chicago, Urban Economics Report, Chicago, IL, 1975.

"Environmental Impacts of an Electrical Energy Systems Growth," with G. Fishelson, University of Chicago, Urban Economics Report, Chicago, IL, 1975.

"The Commonwealth Edison System," with G. Fishelson, University of Chicago, Urban Economics Report, Chicago, IL, 1975.

"The Feasibility of Mining Coal in Iowa: An Economic Evaluation," with R. A. Levins and M. D. Boehlje, Iowa State University, Energy and Mineral Resources Research Institute Report No. IS-ICP-6, Ames, IA, 1975.

"Development of Iowa Coal: A Systems Analytical Approach," with R. Levins and A. Pagoulatos, Iowa State University, Energy and Mineral Resources Research Institute Report No. IS-ICP-9, Ames, IA, 1975.

"Construction of Decision Support System for the National Grains Authority of the Philippines: Part II," with Joseph Yassour, AID Contract No. AID/DSAN-C-0001, Washington, DC, 1979.

"Construction of Decision Support Systems for Agricultural Marketing Boards and Other Public Agencies in Less Developed Countries: Part I," with Joseph Yassour, AID Contract No. AID/DSAN-C-0001, Washington, DC, 1979.

"An Optimal Dynamic Hedging Model for Grains," with Ray Nelson and Andrew Schmitz, University of California, Department of Agricultural and Resource Economics, unpublished manuscript, Berkeley, CA, 1981.

"Post-Bayesian Statistical Inference," with Arnold Faden, University of California, Department of Agricultural and Resource Economics, unpublished manuscript, Berkeley, CA, 1982.

"The Efficiency and Equity Implications of Policy Alternatives in Agricultural Systems of LDCs," with Richard E. Just and David Zilberman, University of California, Department of Agricultural and Resource Economics, unpublished manuscript, Berkeley, CA, 1982.

"Real Income Stabilization and Food Security for LDC's," with Kathryn M. Gordon, University of California, Department of Agricultural and Resource Economics, unpublished manuscript, Berkeley, CA, 1984.

"Lead-Lag Price Relationships Among Commodity Futures Markets," with Colin A. Carter, University of California, Department of Agricultural and Resource Economics, unpublished manuscript, Berkeley, CA, 1985.

"Exchange Rates: Backward Linkage on U.S. Agriculture—The Case of Japan," with Yasuo Nishiyama, University of California, Department of Agricultural and Resource Economics Working Paper No. 389, Berkeley, CA, 1985.

"Information, Risk Allocation, Transaction, and Linkage Efficiencies in Futures Markets," with William E. Foster, Dermot Hayes, and Nicholas Walraven, University of California, Department of Agricultural and Resource Economics, unpublished manuscript, Berkeley, CA, 1986.

"Multiple Effects of Exchange Rates on Import Demand: The Case of U.S. Agricultural Trade with Japan," with Yasuo Nishiyama, University of California, Department of Agricultural and Resource Economics, unpublished manuscript, Berkeley, CA, 1986.

"Effects of Dollar Value Changes." Report to the Conference on *Pacific Rim: Issues and Opportunities*, California Agricultural Trade Seminars, 1986.

"Sources of Misery in California and U.S. Agriculture," Report presented to the California League of Women Voters, Los Angeles, CA, 1986.

"The Effects of Monetary Policy on U.S. Agriculture," with James A. Chalfant, H. Alan Love, and Kostas G. Stamoulis, University of California, Department of Agricultural and Resource Economics Working Paper No. 409, Berkeley, CA, 1986.

"Political Failure and the Design of U.S. Agricultural Policy," *The Science of Agriculture and Natural Resources—A Foundation for the Future*, Division of Agricultural and Natural Resources, University of California, Berkeley, CA, 1986.

"Macroeconomics, Overshooting, and the U.S. Agriculture Sector," with Yasuo Nishiyama and Kostas G. Stamoulis, University of California, Department of Agricultural and Resource Economics Working Paper No. 410, Berkeley, CA, 1986.

"Futures Market and Efficiency," with Nicholas A. Walraven, University of California, Department of Agricultural and Resource Economics Working Paper No. 411, Berkeley, CA, 1986.

"Monetary Policy and Relative Farm Prices," with James A. Chalfant and Kostas G. Stamoulis, University of California, Department of Agricultural and Resource Economics Working Paper No. 413, Berkeley, CA.

"Political Failure and the Design of U.S. Agricultural Policy," *Town Hall California Reporter*, March/April, 1987, pp. 3 and 4.

"Agriculture Research: The Incidence of Burden in the Public and Private Sector," Confidential Report to the Agriculture Research Service, U.S. Department of Agriculture, 1987.

"GATT Negotiations and Agriculture: Alternative Measures of Government Intervention," Confidential Report presented to the U.S. Trade Representative, Washington, DC, 1987.

"Necessary and Sufficient Conditions for Policy Reform," Report to the Agency for International Development, Washington, DC, 1987.

"Political Failure and the Reform of Agricultural Policy," Paper presented to the Australian Society of Agricultural Economics, Adelaide, Australia, February, 1987.

"The Design and Implementation of Public Policy Reform," Report to the Agency for International Development, Washington, DC, 1987.

"The Environmental Effects of U.S. Agriculture and Food Policies: The Case of Water Quality and Quantity," Confidential Report presented to the Environmental Protection Agency, Washington, DC, 1987.

"The Effects of U.S. Macro and Micro Policies on LDC Debtors: Measuring Commodity Price Linkages," with Marjorie Rose. Report presented to the International Monetary Fund, Washington, DC, 1987.

"Restructuring the Farm Credit System," with Susan Woodward, Confidential Report to the Farm Credit Administration, Washington, DC, 1987.

"Agricultural Policy in Economies with Uncertainty and Incomplete Markets," with Robert D. Innes, University of California, Department of Agricultural and Resource Economics Working Paper No. 457, Berkeley, CA, 1987.

"Determination of the Predominance of Various Expectation Patterns in Commodity Future and Spot Markets," with Richard E. Just, University of California, Department of Agricultural and Resource Economics, unpublished manuscript, Berkeley, CA, 1988.

"Flexible Public Policy: The Case of the United States Wheat Sector," with H. Alan Love, Oregon State University, Department of Agricultural and Resource Economics, unpublished manuscript, Corvallis, OR, 1988.

"The Costa Rica Mission and Economic Analytical Support," Confidential Report to the Administrator, Agency for International Development, November, 1988.

"The El Salvador Mission and Economic Analytical Support," Confidential Report to the Administrator, Agency for International Development, November, 1988.

"Government Credibility, Partial Compensation, and the Market for Policy Reform," Report to the International Agricultural Trade Consortium, August, 1988.

- "The Guatemala Mission and Economic Analytical Support," Confidential Report to the Administrator, Agency for International Development, November, 1988.
- "The Honduras Mission and Economic Analytical Support," Confidential Report to the Administrator, Agency for International Development, November, 1988.
- "Toward a Framework for the Design of Internal Agricultural Policy Reform," Report presented to the Economic Research Service, U. S. Department of Agriculture, 1988.
- "Flexible Public Policy: The Case of the United States Wheat Sector," with H. Alan Love, Department of Agricultural and Resource Management Working Paper No. 494, University of California, Berkeley, 1988.
- "Endogenizing U.S. Milk Price Supports, with Harry de Gorter, Department of Agricultural and Resource Management Working Paper No. 504, University of California, Berkeley, 1989.
- "An A.I.D. Economic Research Associate and Fellowship Program," Position paper to the Administrator, Agency for International Development, unpublished, January, 1989.
- "An Economic Development Consortium," Position paper to the Administrator, Agency for International Development, unpublished, January, 1989.
- "An Institute for Policy Reform," Position paper to the Administrator, Agency for International Development, unpublished, January, 1989.
- "Third World Debt and A.I.D.'s Position," Confidential Report to the Administrator, Agency for International Development, January, 1989.
- "The Afghanistan Mission and Economic Analytical Support," Confidential Report to the Administrator, Agency for International Development, March, 1989.
- "The Bangladesh Mission and Economic Analytical Support," Confidential Report to the Administrator, Agency for International Development, March, 1989.
- "The Indonesia Mission and Economic Analytical Support," Confidential Report to the Administrator, Agency for International Development, March, 1989.
- "Major Economic Constraints, Challenges and Objectives of the U. S. Foreign Assistance Program," Position paper to the Administrator, Agency for International Development, unpublished, March, 1989.
- "The Pakistan Mission and Economic Analytical Support," Confidential Report to the Administrator, Agency for International Development, March, 1989.
- "The Philippines Mission and Economic Analytical Support," Confidential Report to the Administrator, Agency for International Development, March, 1989.
- "The Thailand Mission and Economic Analytical Support," Confidential Report to the Administrator, Agency for International Development, March, 1989.
- "Privatization and the Provision of Social Services," Confidential Report to the Administrator, Agency for International Development, April, 1989.

"A New Approach to Country Development Strategy Statements," Report to the Administrator, Agency for International Development, May, 1989.

"The Structure of the Intergovernmental Group on Indonesia," unpublished report to the 32nd Meeting of the Intergovernmental Group on Indonesia, The Hague, Netherlands, June, 1989.

"United States Pledging Statement," report to the 32nd Meeting of the Intergovernmental Group on Indonesia, The Hague, The Netherlands, June, 1989.

"Professional Relationships and the Role of Increasing Sophistication: Agricultural Economics and Economics," with Richard E. Just, University of California, Department of Agricultural and Resource Economics, unpublished manuscript, Berkeley, CA, August, 1989.

"Farm Capital Structure and the Agency Cost of Outside Equity Ownership", with Kathryn M. Gordon, Department of Agricultural Resource Economics, University of California, Berkeley, CA, 1990.

"Urban Labor Markets and Economic Policy/Institutional Reform: Summary of a Workshop," (one of many collaborators). Development Discussion Paper No. 329 (Economic Policy Series), Harvard Institute for International Development, Cambridge, MA, April, 1990.

"Endogenous Policy Theory: The Political Structure and Policy Formation," with Pinhas Zusman, Working Paper No. 537, Department of Agricultural and Resource Economics, University of California, Berkeley, CA, 1990.

"The Role of Institutions and Policy Reform in U.S. Foreign Assistance," Working Paper No. 522, Department of Agricultural and Resource Economics, University of California, Berkeley, CA, 1990.

"Futures Market Performance and Behavior," Report prepared for the Managed Futures Symposium, New York, NY, May 1-3, 1991.

"International Policy Reform: Opportunities and Obstacles," prepared for Plenary Presentation at the Summer 1991 Meeting of the Business-Higher Education Forum, University of California, Santa Barbara, June 27-29, 1991.

"Multidisciplinary Problem-Solving and Issue-Oriented Work with the PC/TC Approach," prepared for the multidisciplinary workshop on "Strategies and Agendas for the Rural Social Sciences," the Social Science Agricultural Agenda Project sponsored by The American Agricultural Economics Association, the Rural Sociological Society, the Agricultural History Society, and others, Kansas City, MO, August 1-4, 1991.

"Animal Agriculture's Impact on Water Quality in California," prepared for panel discussion at a conference sponsored by the University of California Animal Agriculture Research Center, Agricultural Issues Center, and the Division of Agriculture and Natural Resources, Sacramento, California, October 20, 1994.

"Trade Analyses and Policy Design (TAPD) Activity to Support Agriculture and Agribusiness Projects in Central and Eastern European Countries," Project report, Department of Agricultural and Resource Economics, University of California at Berkeley; coordinated by the Institute of

Policy Reform (Grant No. M2055, Fund No. 79048) and funded by the U.S. Agency for International Development (Agreement PDC-0095-A-00-1126-00).

"A Computable Policy Model of Eastern European Agriculture and the Food Industry," with Goodhue, Janda, Lyons, and Simon, *Prague Economic Papers*, No. 1, 1996, pp. 70-79.

"LDC Debt and Policy Linkages in the Determination of World Commodity Prices," with Coleman Bazelon, Working Paper No. 538, Department of Agricultural and Resource Management, University of California, Berkeley, CA.

"Coupling Wealth Transfer Under Uncertain Rates of Technical Change," with William E. Foster, Working Paper No. 542, Department of Agricultural and Resource Management, University of California, Berkeley, CA.

"Policy Preference Functions: Grand Themes and New Directions," with H. Alan Love and Diana M. Burton, Working Paper No. 571, Department of Agricultural and Resource Management, University of California, Berkeley, CA.

"Food Security, Land Allocation and Country Hedging: A Case Study of China," with Jianmin Liu, Working Paper No. 594, Department of Agricultural and Resource Management, University of California, Berkeley, CA.

"Interactions Among Money, Exchange Rates and Commodity Prices," with Pier-Giorgio Ardeni, Working Paper No. 621, Department of Agriculture and Resource Management, University of California, Berkeley, CA.

"Burden Sharing and Public Good Investments in Policy Reform," with Leo K. Simon, Working Paper No. 635, Department of Agricultural and Resource Management, University of California, Berkeley, CA.

"Burden Sharing and Public Good Investments in Policy Reform: A Numerical Sensitivity Analysis," with Leo K. Simon, Working Paper No. 637, Department of Agricultural and Resource Management, University of California, Berkeley, CA.

"A Framework for Analyzing Specific Agricultural Policy Reform," with Richard E. Just and David Zilberman, Working Paper No. 647, Department of Agricultural and Resource Management, University of California, Berkeley, CA.

"Commodity versus Research Policy Under Endogenous Political Weights," with Harry de Gorter and Jo Swinner, Working Paper No. 649, Department of Agricultural and Resource Management, University of California, Berkeley, CA.

"Academic Research in Future Markets Performance and Behavior," Working Paper No. 656, Department of Agricultural and Resource Management, University of California, Berkeley, CA.

"The Political Economy of Productive and Predatory Policies: The Case of U.S. Dairy Policy," with Harry de Gorter and David Nielson, Working Paper No. 661, Department of Agricultural and Resource Management, University of California, Berkeley, CA.

"A Strategic Model of Environmental Dispute Resolution," with Leo K. Simon, Working Paper No. 662, Department of Agricultural and Resource Management, University of California, Berkeley, CA.

"Transition to Market Economy: The Case of Russia," Working Paper No. 666, Department of Agricultural and Resource Management, University of California, Berkeley, CA.

"Multilateral Bargaining in a Spatial Environment: Preliminary Results," with Glenn W. Harrison, Ron Harstad and Leo K. Simon, Working Paper No. 670, Department of Agricultural and Resource Management, University of California, Berkeley, CA.

"Instrument Selection in a Bargaining Model of Agricultural and Environmental Policy Reform," with Leo K. Simon, Working Paper No. 707, Department of Agricultural and Resource Management, University of California, Berkeley, CA.

"The Political Economy of Transition: A Bargaining Theoretic Approach," with Robert F. Lyons and Leo K. Simon, Working Paper No. 709, Department of Agricultural and Resource Management, University of California, Berkeley, CA.

"The Economics of Remediation: The Decision Problem Facing a Single PRP," with Leo K. Simon and Jinhua Zhao, Working Paper No. 711, Department of Agricultural and Resource Management, University of California, Berkeley, CA.

"Independence of Irrelevant Alternative and Political Economy: A Critique and an Alternative," with Leo K. Simon and Klaas van't Veld, Working Paper No. 720, Department of Agricultural and Resource Management, University of California, Berkeley, CA.

"Inequality and the Choice of Redistributive and Public Good Policies: The Case of Agriculture," with Harry de Gorter and Johan F.M. Swinnen, Working Paper No. 742, Department of Agricultural and Resource Management, University of California, Berkeley, CA.

"The Analytical Framework for the TAPD Project," with Rachel Goodhue, Robert Lyons and Leo K. Simon, Working Paper No. 762, Department of Agricultural and Resource Management, University of California, Berkeley, CA.

"Food Demand in the Czech Republic," with Karl Janda, Working Paper No. 796, Department of Agricultural and Resource Management, University of California, Berkeley, CA.

"The Economic Value of Patents, Licenses and Plant Variety Protection," with Arthur A. Small, Working Paper No. 797, Department of Agricultural and Resource Management, University of California, Berkeley, CA.

CASE STUDIES

Harvard University Graduate School of Business Administration

Simulation Models in Agribusiness, Spring, 1974.

Survey and Use of Decision Support Systems, Spring, 1974.

Don Gingrey, Spring, 1975.

J Bar Ranch, Spring, 1975.

John Duckworth, Spring, 1975.

Note on Commodity Future Price Behavior and Efficient Markets, Spring, 1975.

Unique Features of Dynamic Agricultural Systems, Spring, 1975.

The U.S. Corn System, Spring, 1975.

- U.S. Reserve Stocks in International Trade*, Spring, 1975.
Chase Econometric Associates, Inc., Spring, 1976.
Chemical Bank (a), Spring, 1976.
Chemical Bank (b), Spring, 1976.
Common Commodity Future Market Fund, Spring, 1976.
Data Resources, Inc., Spring, 1976.
Design and Implementation of Decision Models, Spring, 1976.
Florida Department of Citrus, Spring, 1976.
Food Grain Import Policies in Bangladesh (a), Spring, 1976.
Food Grain Import Policies in Bangladesh (b), Spring, 1976.
Hedging and Pure Speculation, Spring, 1976.
Israel Poultry Marketing Board, Spring, 1976.
Rancho Matilija, Spring, 1976.
Statistical Decision Theory Frameworks, Spring, 1976.
Thomte and Company, Spring, 1976.
Choosing Among Risk Profiles, Fall, 1976.
Importance of a Good Forecasting System, Fall, 1976.
Agricultural Chemical International, Spring, 1977.
Contractual Relationships in the Turkey Industry, Spring, 1977.
Contractual Relationships in the Beet Sugar Industry, Spring, 1977.
Fed-Rite Food Distribution, Spring, 1977.
Forecasting in the Food Freezing Sector, Spring, 1977.
High Fructose Corn Syrup Manufacturing (a), Spring, 1977.
High Fructose Corn Syrup Manufacturing (b), Spring, 1977.
Note on Risk Management Frameworks, Spring, 1977.
Proposals for Grain Reserves, Spring, 1977.
Spreckels Sugar Division (a), Spring, 1977.
Spreckels Sugar Division (b), Spring, 1977.
U.S. Feed Grain Reserve Policy, Spring, 1977.
Biogas of Colorado, Spring, 1978.
Biotechnology and Agribusiness, Spring, 1978.
Costs and Benefits of Models and Their Use in the Food Sector, Spring, 1978.
Crown Zellerbach and the Management of Natural Resources, Spring, 1978.
DRI Commodity Management Consultants, Spring, 1978.
Effective Management and Utilization of Information Systems, Spring, 1978.
Food Conglomerate, Inc., Spring, 1978.
MacIntosh Chocolate Company (a), Spring, 1978.
MacIntosh Chocolate Company (b), Spring, 1978.
MacIntosh Chocolate Company (c), Spring, 1978.
MacIntosh Chocolate Company (d), Spring, 1978.
Manual for Designing, Constructing, and Using a Decision Support System, Spring, 1978.
Note on Agricultural Sector Forecasts and Policy Evaluations, Spring, 1978.
Note on Market Risk in Agribusiness, Spring, 1978.
Note on Strategic Policy Evaluations, Spring, 1978.
The Philippines National Rice and Grain Authority, Spring, 1978.
Tariff and Nontariff Trade Barriers, Spring, 1978.
The World Bank and Agriculture in Less Developed Countries, Spring, 1978.

SELECTED KEYNOTE OR PLENARY SESSION PRESENTATIONS

Value Differentiation in Agriculture: Driving Forces and Complementarities. Prepared for "Vertical Relationships and Coordination in the Food System," University of California at Berkeley, June 12-13, 1997.

Deriving Biodiversity Option Value within a Model of Biotechnology Research and Development. Presented at the 1997 Workshop on Valuation and Environmental Policy. NSF/EPA Partnership for Environmental Research, Arlington, VA, April 7-8, 1997.

Taking Responsibility for our Environments. 3rd Annual Environmental Partnerships Symposium, "The City and the Environment," University of California at Berkeley, November 22, 1996.

Incentive Structures for Allocating Public Research Resources. Presented at the Conference, "Global Agricultural Science Policy for the Twenty-First Century," Melbourne, Australia, August 16-18, 1996.

Presented opening remarks to conference, "Voices from the Commons," International Association for the Study of Common Property, University of California, Berkeley, June 5, 1996.

A New Perspective on Sustainability: A Framework of Dispute Resolution. Presented to the Environmental Leadership Roundtable. University of California Extension, San Francisco, California, May 17, 1996.

Cooperatives in Transition: Pros and Cons of Free Enterprise in an Uncertain World. Presented at the Conference, "Industrial Organization and the Food Processing Industry," Toulouse, France, March 28-29, 1996.

Institutions, Scientific Technology, and the Future of Agriculture. Presented to the American Feed Industry Association Key Management Conference, San Diego, California, February 9, 1996.

Institutions, Scientific Technology, and the Future of Agriculture. Presented to the South Central Regional Academic Conference, Division of Agricultural and Natural Resources, University of California, Salinas, California, February 8, 1996.

U.S. Agricultural Policy in the United States. Presented at a University of California Discussion. Berkeley, California, September 13, 1995.

A Computable Policy Model of East European Agriculture. Presented at the IPE-CERGE-EI Conference, "Agriculture and Trade Transition Economies: Policy Design and Implementation," Prague, Czech Republic, July 28-29, 1995.

The Future of California's Natural Resources. Presented to the State of California Resources Agency, University of California, Davis, June 22, 1995.

The Environmental Population Tradeoff. Presented at the symposium, "Shaping Agriculture in the 21st Century," Radisson Hotel, Davis, California, June 22, 1995.

The College of Natural Resources and Agriculture. Presented to the University Committee on Research Policy, University of California, Oakland, California, June 20, 1995.

The College of Natural Resources Commencement Ceremony, 1995. Presented to the graduating class of 1995, University of California, Berkeley, May, 1995.

Modeling Multilateral Bargaining and Negotiation Processes. Presented at the School of Business, Stanford University, Stanford, California, May, 1995.

A Vision for the College of Natural Resources. Presented at the Nutrition, Education, and Family Development Symposium, University of California, Berkeley, May 17, 1995.

Campus Environmentalism/Earth Day. Presented at the Environmental Spirit Conference (Earth Day), University of California, Berkeley, April 13, 1995.

Sustainable Agriculture and Pest Control. Presented to the Faculty and Student Symposium on Sustainable Agriculture and Pest Control, University of California, Berkeley, April 12, 1995.

A New Structure for the College of Natural Resources. Presented to UC Berkeley's Council of Deans, University of California, Berkeley, April 4, 1995.

Regulating Multiple Polluters: Deterrence and Liability Allocation. Presented at the University of Michigan, February, 1995.

The College of Natural Resources' Role in Biology. Presented to the Chancellor's Advisory Council, University of California, Berkeley, January 25, 1995.

The Economic Situation and its Impact on Tomorrow's Business. Presented at the Protein Technologies International Conference. "Staying Ahead of Competition," a seminar of macro and micro issues affecting the poultry industry, Atlanta, Georgia, January 17, 1995.

International Environmental Regulations. Address at the Institute D'Economie Industrielle, Toulouse, France, November, 1994.

The Future of California Agriculture. Presented to the Ad Hoc Division of Natural Resources Committee (TICHO), University of California, Oakland, California, January 6, 1995.

Challenges to California Agriculture. Presented at Executive Seminar on Agricultural Issues, Sacramento, California, December 13, 1994.

Strategies and Options for Sustaining Animal Agriculture—A Watershed Perspective. Panelist at the Animal Agriculture Impacts on Water Quality in California Conference, Animal Agriculture Research Center and Agricultural Issues Center, University of California at Davis, Sacramento, California, October 20, 1994.

Valuation of Intellectual Property. Presented at Stanford Law School, Stanford University, Stanford, California, October 7, 1994.

Political Economic Processes and Collective Decision Making, presented at XXII International Conference of Agricultural Economists, Harare, Zimbabwe, August 22-30, 1994.

Passive versus Active Natural Resource Damages, presented at the University of Chicago, June 2, 1994.

Political Interest Groups, Compensation, and the GATT Negotiation Process, presented at the conference "The Impact of the Uruguay Round on International Trade," Washington, DC, June 15, 1994.

The Political Economy of Natural Resources and the Environment, Seminar for the College of Natural Resources, University of California, Berkeley, May 3, 1994.

Alternative Framework for Evaluating Natural Resource Damages, presented at the University of California, Los Angeles, April 7, 1994.

GATT Agricultural Policy Reform: A United States Perspective, major address to Regional Counsel on Strategies and Perspectives on Agricultural Policies, presented at the conference "Agricultural Markets: Mechanisms, Failures, Regulations," Institute D'Economie Industrielle, Toulouse, France, October 12-13, 1993.

The Political Economy of Agricultural/Environmental Policy Reform, presented at the conference "Agricultural Markets: Mechanisms, Failures, Regulations," Institute D'Economie Industrielle, Toulouse, France, October 12-13, 1993.

The Political Economy of Technology and Commodity Policy in the U.S. Dairy Industry, presented at the conference "Agricultural Markets: Mechanisms, Failures, Regulations," Institute D'Economie Industrielle, Toulouse, France, October 12-13, 1993.

Political Power Theory: Explanation and Description. Opening invited address at Pinhas Zusman Retirement Conference, Hebrew University, Rehovot, Israel, June, 1993.

Endogenous Political Economy. Presented at Ben Gurion University, Israel, June, 1993.

Transition to a Market Economy: The Case of Russia, Keynote address to U.S. Fund for Democracy and Development, March, 1993.

Recent Advances on Futures Markets Performance and Behavior, presented at the Fourth Annual Managed Futures Symposium. "Managed Futures as an Institutional Investment," Chicago, September 30 through October 2, 1992.

An Emerging Framework for Economic Development: An LDC Perspective, Keynote address at the conference, "Industrial Policy for Agriculture in the Global Economy," Iowa State University, Ames, IA, September 16 and 17, 1992.

New Frameworks for Designing Compatible Incentives for Policy Reform, Invited address to the U.S. Agency for International Development, September, 1992.

Internal Versus External Agricultural Policy Reform: GATT Negotiations in the Uruguay Round, Invited Paper for the American Political Science Association, Chicago, IL, September, 1992.

A Noncooperative Model of Collective Decisionmaking: A Multilateral Bargaining Approach, presented at the American Political Science Association meetings, Chicago, IL, September, 1992.

A Collective Choice Model for Conflict Resolution in Water Resource Systems, presented at the conference, "Water Quantity/Quality Disputes and the Resolution," Washington, DC, May 2-3, 1992.

State-Market-Civil Institutions: The Case of Eastern Europe, Major invited address at the conference, "State, Market and Civil Institutions: New Theories, New Practices, and Their Implications for Rural Development," Cornell University, New York, December 13-14, 1991.

Liberties and Economic Growth, Keynote address presented at the World Conference on Economic Development, Raleigh-Durham, NC, November 19-21, 1991.

Multidisciplinary Problem-Solving and Issue-Oriented Work with the PC/TC Approach, Keynote address at the multidisciplinary workshop on "Strategies and Agendas for the Rural Social Sciences" under the auspices of the Social Science Agricultural Agenda Project sponsored by The American Agricultural Economics Association, the Rural Sociological Society, the Agricultural History Society, and others, Kansas City, MO, August 1-4, 1991.

International Policy Reform: Opportunities and Obstacles, Plenary presentation at the Summer 1991 Meeting of the Business-Higher Education Forum, University of California, Santa Barbara, June 27-29, 1991.

The Political Economy of Transition in Eastern Europe: Packaging Enterprises for Privatization, Paper presented at the Institute of International Studies, University of California, Berkeley, CA, May, 1991.

Futures Market Performance and Behavior, Keynote address at the Managed Futures Symposium, New York, NY, May 1-3, 1991.

The Political Economy of Transition in Eastern Europe: Packaging Enterprises for Privatization, Paper presented at Simon Fraser University, British Columbia, Canada, April, 1991.

The Political Economy of Transition in Eastern Europe: Packaging Enterprises for Privatization, Paper presented at the Institute of Policy Reform Conference on Institutions and the Transition to a Market Economy, Prague, Czechoslovakia, March, 1991.

Agricultural Reforms in the USSR: A Scientist's Attitude, Paper presented at the Soviet-American Symposium, Moscow, October, 1990.

The Political Economy of the European Community's Agricultural Policy, Keynote address to the European Agricultural Economics Association, The Hague, September, 1990.

Market Politics and Alternative Transition Paths, Paper presented at the conference on Rural Reform in Socialist Countries: Dilemmas and Strategies, sponsored by the World Bank and the National Bank of Hungary, Budapest, August/September, 1990.

The Agency for International Development Paradigm on Policy Reform and Economic Development, Major invited address to the Allied Social Science meetings, Atlanta, GA, December, 1989.

Agricultural Policy Alternatives for the 1990s, Keynote address to the American Agricultural Law Association, San Francisco, CA, November, 1989.

A New Paradigm for Economic Development, Keynote address at the Economic Development Consortium, November, 1989.

An Assessment of the Agricultural Economics Profession, Major invited address to the American Agricultural Economics Association meetings, Baton Rouge, LA, August, 1989.

New Institutional Economics and Public Policy, Major invited address to the Development Studies Program, Institute for International Research, The American University, July, 1989.

The Evolution and Coordination of U.S. Commodity and Resource Policies, Keynote address at the CARP Symposium, University of Maryland, College Park, MD, May, 1989.

Supporting Coalitions for Policy Reform and Institutional Change, Invited Plenary presentation to the Indonesian Economic Association, Thailand Economic Association, Pakistan Economic Association, Bangladesh Economic Association, Egyptian Economic Association, February, 1989.

The Market for Public Policy Reform, Invited Plenary address to the 33rd Annual Conference of the Australian Agricultural Economics Society, New Zealand, February, 1989.

Dynamic Welfare Analysis in Commodity Futures Markets, Major invited address to the International Conference of the Applied Econometrics Association, Washington, DC, October, 1988.

Endogenizing Policy in Models of Agricultural Markets, Major invited address presented at the Plenary Session of the International Association of Agricultural Economists, Buenos Aires, Argentina, August, 1988.

Trade Negotiations, Institutional Changes, and Policy Reform, Major invited address to the International Agricultural Trade Consortium, Washington, DC, August, 1988.

The Macroeconomic Dimension of Agricultural Policy Reform, Major invited address at the World Food Conference, Ames, IA, June, 1988.

The Design and Implementation of Public Policy Reform, Keynote address at the Conference on Agricultural Economic Policy Reform in Egypt, Cairo, Egypt, July, 1987.

Stability Issues in Policy Analysis, Major invited address at the Conference on Agricultural Stability in Farm Programs: Concepts, Evidence, and Implications, North Carolina State University, Raleigh, NC, May, 1987.

Alternative U.S. Agricultural Trade Policy, Major address to the Benjamin E. Lippincott Symposium on Policy Coordination in World Agriculture, University of Minnesota, St. Paul, MN, April, 1987.

Macroeconomic Linkages in U.S. Agriculture, Keynote address at the First Rod F. Ziemer Symposium, University of Georgia, Athens, GA, March, 1987.

Political Failure and the Reform of Agricultural Policy, Keynote address to the Australian Agricultural Economics Society, Adelaide, February, 1987.

Public Policy in U.S. Agriculture, Major invited address to the School of Agriculture, the University of Western Australia, Perth, February, 1987.

The Formulation of Agricultural Policy in the United States: Circa, 1987, Invited Plenary address to the Australian Agricultural Economics Society and Bureau of Agricultural Economics, Canberra, Australia, February, 1987.

A Coherent Policy for U.S. Agriculture, Major address at the Conference on Food Policy and Politics: A Perspective on Agriculture and Development, Purdue University, West Lafayette, IN, May, 1986.

Macroeconomics, Overshooting, and the Design of Public Policy, Major invited address to the Midwest Economic Association, Chicago, IL, 1986.

The Food Marketing System: Relevance of Economic Efficiency Measures, Major invited address at the Conference on Economic Efficiency and Agriculture and Food Marketing; sponsored by the University of Florida, Farm Foundation and the Agricultural Marketing Service, U.S. Department of Agriculture; Arlington, VA, October, 1985.

Instability in Agricultural Markets: The U. S. Experience, Major invited address to the International Association of Agricultural Economists, Malaga, Spain, August, 1985.

The Design of U.S. Food and Agricultural Policy, Major invited address to the U.S. Congressional Conference, Urban-American Stake in the National Farm Crisis, Washington, DC, April, 1985.

Macroeconomics and Farm Policy, Major address to the American Enterprise Institute, Washington, DC, January, 1985.

A Synthesis of Major Evaluations of Alternative Proposals for the 1985 Food Security Act, Major invited address presented at the National Center for Food and Agricultural Policy and National Agricultural Forum Conference, Policy Choices, 1985, Washington, DC, December, 1984.

Regulation in Commodity Futures Markets, Major invited address to the American Enterprise Institute, Washington, DC, January, 1984.

Equity and Efficiency in Agricultural Production Systems, Major invited address to the Plenary Session of the International Association of Agricultural Economists, Jakarta, Indonesia, 1982.

Political Economic Markets: PERTs and PESTs in Food and Agriculture, Keynote address to the American Agricultural Economics Association Annual Meetings, Logan, UT, 1982.

Modeling Agriculture for Policy Analysis in the 1980s, Invited major address at a special symposium sponsored by the Federal Reserve Bank of Kansas City, September, 1981.

Agriculture, Food, and the Government, Invited address to the American Economics Association Annual Meeting, New York, NY, 1981.

Prospects and Limitations of Operations Research in Agricultural Policy Investigations, Major invited address at the Plenary Session of the International Operations Research Conference, Jerusalem, Israel, 1979.

Natural Resource Economics and Policy, Keynote address to the Farm Foundation Research Workshop, Natural Resource Economics and Policy, University of Massachusetts, Amherst, MA, 1976.

OTHER INVITED SEMINAR PRESENTATIONS

Agency for International Development (27)¹; Agricultural Development Council (4); American Agricultural Economics Association (34); American Agricultural Law Association (1); American Economics Association (11); American Enterprise Institute (2); American Finance Association (5); American Sheep Industry (2); American Statistical Association (9); American Water Resource Association (3); Applied Econometric Association Conference (2); Argentine Universities (9); Australian Agricultural Economics Society (5); Australian National University (3); Brown University (1); California Agricultural Trade Seminars (1); California Women for Agriculture, Los Angeles (2); Chicago Board of Trade (6); Citizens for a Sound Economy Foundation (2); Columbia University (2); Commodity Futures Trading Division of Economic Analysis (1); Commonwealth Club (2); Conference on Agricultural Economic Policy Reform in Egypt (1); Conference of Economywide Effects of Developed Country Agricultural Trade Policies (1); Econometric Society (North American, European, World) (11); Economics Branch, Agriculture Canada (15); European Agricultural Economics Association (1); Farm Credit Council (2); The Ford Foundation (6); Harvard Institute of Development (2); Harvard University (12); Heritage Foundation, Washington, DC (2); Illinois Agricultural Leadership Foundation (1); Institute of Electronics and Electronics Engineers Decision and Control Conferences (2); International Association of Agricultural Economists (6); International Monetary Fund (4); Iowa State University (9); League of Women Voters (Berkeley and Washington, DC) (5); London School of Economics (3); Massachusetts Institute of Technology (4); Melbourne University (3); Michigan State University (2); Midwest Economic Association (2); Monash University (1); National Bureau of Economic Research (7); National Cotton Council of America (2); New York Pension Fund Association (2); North Carolina State University (6); Northern Illinois University (3); Oklahoma State University (1); Operations Research Society (5); Organization of Professional Employees (3); Princeton University (2); Purdue University (6); Regional Research Strategy Committees (9); Rotary Club of Berkeley (1); Soviet-American Symposium (1); Stanford University (4); State University of New York (2); Texas A&M University (2); The Institute of Management Sciences (4); Town Hall of California, Los Angeles (1); Trade Policy Research Center, United Kingdom (3); University of Adelaide (1); University of California at Berkeley (28); University of California, Davis (9); University of California, Los Angeles (4); University of California, Santa Barbara (2); University of Chicago (9); University of Florida (2); University of Georgia (1); University of Heidelberg (1); University of Illinois (3); University of Maryland (1); University of Massachusetts, Amherst (2); University of Minnesota (5); University of Missouri (3); University of Nebraska (1); University of New England (3); University of North Carolina (1); University of Pennsylvania (3); University of Prague (1); University of Rhode Island (1); University of Salsberg (1); University of Saskatchewan (1); University of Sydney (2); University of Western Australia (2); U.S. Department of Agriculture (15); Washington, DC, Economists Club (3); Western Economics Association (7); World Affairs Council (2); World Perspective Seminar (1); The World Bank (9); Yale University (3); Institute for Policy Reform (12).

PROFESSIONAL, UNIVERSITY, AND PUBLIC SERVICE

Graduate Group in Energy and Resources, University of California at Berkeley, 1996 - present .

¹ Number of presentations

Board of Advisors, Lawrence Hall of Science, University of California at Berkeley, 1996 - present.

Chair, Advisory Committee, Kearney Foundation, University of California at Berkeley, 1995.

Executive Committee, International and Area Studies Executive Committee, University of California at Berkeley, 1994 - present.

Council of Deans, University of California at Berkeley, 1994 - present.

Chancellor's Advisory Committee on Biology, University of California at Berkeley, 1994 - present.

Ex officio member, College of Natural Resources Advisory Board, University of California at Berkeley, 1994 - present.

Executive Committee of Environmental Council, University of California at Berkeley, 1994 - present.

Council of Deans and Directors, University of California, Systemwide, 1994 - present.

College of Natural Resources Advisory Board, University of California at Berkeley, 1994 - present.

College of Natural Resources Development Committee, University of California at Berkeley, 1994 - present.

University Extension Committee, Berkeley Division, Academic Senate, University of California at Berkeley, 1993-94.

Cooperator, "Higher Education Collaboration Between the United States and the European Community," the Fund for the Improvement of Postsecondary Education (FIPSE), 1993- present .

Agricultural and Food Marketing Consortium Planning Committee, 1993-94.

Chair, Search Committee for Chair of Slavic Center, University of California at Berkeley, 1993-94.

Member Capital Campaign 2001. Knowledge for the Future, Subgroup: Environment, Resources, and Ecology, 1993.

Member, Board for International Development Studies, Fletcher School of Law and Diplomacy, Tufts University, 1992 - present .

Berkeley Division, Academic Senate, Committee on University Extension, 1992 - present .

Member of Advisory Board, International Center for Self-Governance, 1991-94.

College of Natural Resources Committee to Form International Institute for Natural Resource Systems, University of California, Berkeley, CA, 1991-92.

Chairman, Search Committee for Director of Soviet Studies, 1991.

College of Natural Resources Internal Review Committee, University of California, Berkeley, CA, 1990-92.

Agricultural Academy of Science-Soviet Union Delegation, 1990.

Cofounder of the Institute for Policy Reform, Washington, DC, 1989.

Founder of the Agency for International Development Research Fellow Program, 1989.

Dean's Selection Committee for College of Natural Resources Technical Advisory Committee, 1989.

Member, Economic Discipline Board, Fulbright Scholarship Awards, 1989 - present.

University of California Systemwide Energy Research Advisory Committee, 1988 - present.

Editor, *Agricultural Management and Economics*, Springer-Verlag, 1988-92.

Chairman and Member, Berkeley Campuswide Committee to Evaluate the Department of Economics and Related Economics Programs, 1988-89.

Board of Directors, Universitywide Energy Research Center, 1988-92.

Resources for the Future, National Center for Food and Ag. Cultural Policy Task Force on Multilateral Trade Negotiations, 1988.

U.S. Department of Agriculture. Task Force on Analytical Research Supporting the Trade Representatives Office, 1988.

Advisory Committee, Environmental Protection Agency, Evaluation of Environmental Regulations on Agriculture, 1987-89.

Member, Advisory Committee, Government Accounting Office on U.S. Agricultural Export Strategies, 1987-88.

Departmental Faculty/Extension Coordination Committee, University of California, Berkeley, CA, 1987-88.

Chairman, Political Economy of Natural Resources Panel, 1987-88.

United States Negotiating Team for the OECD Communique on Agricultural Reform, May, 1987.

United States Senate Panel on "1985 Farm Bill Revisited: Competitive Views," March, 1987.

Council for Foreign Relations Task Force on Trade Policy Options for the United States, 1987.

General Accounting Office Task Force on Alternative Public/Private Marketing Mechanisms for U. S. Food and Agriculture, 1987.

U.S. Government Task Force on U.S. Agricultural Policy and Position in GATT Negotiations, 1987-88.

U. S. Government Task Force on the Farm Credit System, 1987.

Member, Evaluation of EPA Regulation on U.S. Agricultural Sector Committee, 1987-88.

Chairman and Member, School of Business Administration Planning Committee, University of California, Berkeley, CA, 1986-87.

- Editor, *American Journal of Agricultural Economics*, 1983-86.
- Organizational Committee for Farm Policy-Technology Conference, Agricultural Issues Center, University of California at Davis, CA, 1986.
- American Agricultural Economics Association Committee on Journal Publishing, 1986.
- Member, Search and Selection Committee for Vice President of Agriculture and Natural Resources, University of California Systemwide, 1985-86.
- Chairman, Strategic Review of Giannini Foundation, 1985-86.
- Member, Agricultural Policy Planning Committee, American Agricultural Economics Association, 1984-86.
- Member, Planning Committee for Agriculture and Food Policy Evaluation, Resources for the Future, 1984-85.
- Departmental Food and Agricultural Act Symposium Committee, University of California at Berkeley, 1984-86.
- The American Agricultural Economics Association Board of Directors, ex officio, 1984-86.
- Member, Advisory Committee for the design of the Agricultural Issues Center, University of California Systemwide, 1984-85.
- Chairman, American Agricultural Economics Association, Outstanding Journal Article Committee, 1983-86.
- Member and Director, Agriculture Study Group, Commonwealth Club, 1983-85.
- Chairman, Western Agricultural Economics Research Council, 1982-83.
- Vice Chairman, Western Agricultural Economics Research Council, 1981-82.
- American Agricultural Economics Association Publication of Enduring Quality Award Committee, 1981-82.
- Western Nutrition Center Planning Committee, 1980-82.
- Western Nutrition Center Coordinating Committee, 1980-81.
- Secretary, Western Agricultural Economics Research Council, 1980-81.
- Member, Planning Committee, Berkeley Food Cooperative, 1980-83.
- Evaluation of World Bank Research Proposals (14 evaluations), 1979-92.
- Member, Board of Directors, Giannini Foundation of Agricultural Economics, 1979-86.
- Executive Committee, Giannini Foundation, 1979-86.
- Chairman, Departmental Endowment Committee, University of California, Berkeley, CA, 1979-84.

Joint Land Grant University/U.S. Department of Agriculture Committee on New Research Directions, 1979-82.

Coordination Board, Giannini Foundation, 1979-82.

Chairman, Joint University Governmental Symposium on Agricultural Sector Forecasting and Policy Evaluations, Washington, DC, 1979.

Arab-American Council for Cultural and Economic Exchange, Egyptian Agricultural Development Committee, 1979-80.

Associate Editor, *Journal of Dynamics and Control*, 1978-82.

Chairman, Research Evaluation Committee for Desert Research Institute, Israel, 1978.

Academic Representative to U.S.-U.S.S.R. Agreement on Cooperation in Agricultural Economic Research and Information, 1977.

Editorial Board, *American Journal of Agricultural Economics*, 1977-80.

Member, World Bank Committee on Research Quality Control, 1976-77.

Harvard University Executive Education Program Instructor, 1975-77.

Agricultural Development Council Workshop Participant, 1974-77.

Associate Book Review Editor, *Journal of the American Statistical Association*, 1974-82.

Member, Outstanding Ph.D. Dissertation Committee, American Agricultural Economics Association, 1974-76.

National Bureau of Economic Research Workshop Participant, 1974-79.

Associate Editor, *Journal of the American Statistical Association*, 1973-77.

Agricultural Econometric Modeling and Forecasting Symposium Participant, 1973-80.

Ford Foundation Visiting Professor, Argentina, 1972.

Numerous Departmental and College-Level Committees, 1970 - present.

College Union Board of Directors, 1966-72.

Interfraternity Council Board, 1965-67.

University of California at Berkeley. Ad Hoc Review Committee for Tenure Appointments (17 appointments, 8 as Chairman).

EDITORIAL COLLABORATIONS

American Economic Review, 1976 - present.

American Journal of Agricultural Economics, 1970 - present.

Annals of Economic and Social Measurement, 1974 - 1977.
Australian Journal of Agricultural Economics, 1977 - present.
Decision Sciences, 1977 - present.
Econometrica, 1974 - present.
Economic Development and Cultural Change, 1985 - present.
Economic Journal, 1986 - present.
IEEE Transactions on Automatic Control, 1977 - present.
Journal of the American Statistical Association, 1971 - present.
Journal of Development Economics, 1982 - present.
Journal of Econometrics, 1973 - present.
Journal of Economic Dynamics and Control, 1978 - present.
Journal of Economic Theory, 1985 - present.
Journal of Economics and Business, 1977 - present.
Journal of Environmental Economics and Management, 1981 - present.
Journal of Finance, 1975 - present.
Journal of Futures Markets, 1986 - present.
Journal of Monetary Economics, 1984 - present.
Journal of Political Economy, 1973 - present.
Management Science, 1977 - present.
Quarterly Journal of Economics, 1976 - present.
Resources and Energy, 1978 - present.
Review of Agricultural Economics, 1990 - present.
Review of Economic Studies, 1987 - present.
Review of Economics and Statistics, 1974 - present.
Review of Futures Markets, 1986 - present.
Springer-Verlag, 1988 - present.
Western Journal of Agricultural Economics, 1977 - present.

AD HOC REVIEWING

Giannini Foundation Monograph Series, 1971 - present.

National Science Foundation, 1976 - present.

World Bank, 1979 - present.

American Enterprise Institute, 1981 - present.

U.S. General Accounting Office, 1983 - present.

Agriculture Canada, 1978 - 1982, 1991 - present.

U.S. Congressional Budget Office, 1982 - present.

United States-Israeli Binational Agricultural Research and Development Fund (BARD), 1980 - present.

U.S. Council of Economic Advisors, 1986 - present.

Club of Paris, various governmental consulting groups, 1988 - present.

Intergovernmental Consulting Group on Indonesia, The Hague, 1989 - 1990.

Ph.D. DIRECTORSHIPS

Fifty-one Ph.D. theses in the areas of Natural Resource Damages; Agricultural Economics and Policy; Industrial Organization and Antitrust Analysis; Water Resources; Human Capital; Recreational Economics; Environmental Economics; Energy Policy; Public Policy; Managerial Economics; Adaptive Control; Econometrics; International Trade; Commodity Markets and Models; Governmental Food and Nutrition Policies; Operational Designs of Decision Support Systems; U.S. Livestock Feed Grain Sector; Agricultural Cycles; Futures Markets; Terms of Trade; Agricultural Land Prices and Agrarian Structure; Land Quality and Soil Conservation; Agricultural Credit Markets; New Institutional Economics and Transaction Costs; Political Economy; Multilateral Negotiations; Design of Governance Structures; Industrial Organization of Food Industry; and Transitional Economics.

RESEARCH GRANTS

Agency for International Development, U.S. State Department (numerous)
Agriculture Cooperative Service, U.S. Department of Agriculture
Agriculture Research Service, U.S. Department of Agriculture (numerous)
Center for Agricultural and Rural Development (numerous)
Chicago Board of Trade
Chicago Mercantile Exchange
Consortium of U.S. Commodity Futures Exchanges
Economic Research Service, U.S. Department of Agriculture (numerous)
Economics Branch, Agriculture Canada (numerous)
Ford Foundation
Giannini Foundation (numerous)
Harvard University Research Institute

International Monetary Fund
National Center for Food and Agricultural Policy (numerous)
National Science Foundation
OECD, France
Resources for the Future
State of Iowa Coal Project
U.S. Trade Representatives Office (numerous)
U.S. Environmental Protection Agency
University of California Systemwide Bio-Technology Research and Education Program
University of California Water Resource Center
Western Human Nutrition Center, U.S. Department of Agriculture
World Bank

GOVERNMENT CONSULTING AND NONACADEMIC POSITIONS

Board of Directors, US Diagnostic Labs, 1994 - present.
President and Board of Directors, Institute for Policy Reform, Washington, DC, 1990 - present.
Nathan Associates, Inc., Washington, DC, 1990 - 1991.
Chief Economist, Agency for International Development, Washington, DC, 1988 - 1990.
Chairman and Board of Directors, TriColor Line, Ltd., 1990 - present.
Principal, Corporate Secretary and Board of Directors, LECG, INC., 1990 - present.
Board of Directors, Source for Automation, Inc., 1988 - present.
Ministry of Agriculture, England, 1987 - 1988.
Senior Staff Economist and Special Consultant to the Council of Economic Advisors, 1986 - 1987.
Bureau of Agricultural Economics, Australia, 1986 - 1987.
Farm Credit Administration, 1986 - 1987.
U.S. Department of State, 1986 - 1990.
U.S. Office of Management and Budget, 1986 - 1987.
Ministry of Agriculture, Spain, 1985.
Chicago Board of Trade, 1982 - 1986.
Chicago Mercantile Exchange, 1980 - 1981.
Oakridge National Laboratories, Energy Division, Oakridge, Tennessee, 1978 - 1981.
Economics Branch, Agriculture Canada, 1977 - 1980.
U.S. Department of Agriculture, 1975 - present.
World Bank, 1975 - 1976 and 1983 - 1988.

U.S. Bureau of Mines, 1974 - 1976.

U.S. Office of Saline Water, 1973 - 1976.

National Science Foundation Environmental Project, University of Chicago, 1973 - 1975.

Manager, California Dairy and Truck Crop Farm, 1967 - 1973.

INDUSTRY CONSULTING AND LITIGATION EXPERIENCE

Extensive consulting experience in complex litigation, statistical decision analysis, experimental economics, class certification analysis, antitrust, regulated industries, measurement of economic damages, economic feasibility studies, market analysis, econometric modeling, hedonic modeling, environmental damages, natural resource valuation, development of portfolio investment models, securities, and the assessment of risk management frameworks.

April 1997

Gordon C. Rausser, Ph.D.
Expert Testimony Given in the Last Four Years

CFTC v. Mark Fisher and other Individuals

Stroock and Stroock and Lavan (1996-1997)

Client: Mark Fisher

- Trial Testimony
- Declaration

Francis T. Lagrimas, et. al v. Southampton Co., et al.

Folger Levin & Kahn (1997)

Client: Plaintiff Class

- Deposition

Union Pacific Railroad, et. al. v. California Public Utilities Commission, et. al.

Union Pacific Railroad Company (1997)

Client: Union Pacific Railroad Company

- Expert Report

Sugai Products, Inc, et al. v. Kona Kai Farms, Inc.

Milberg Weiss Bershad Hynes & Lerach (1997)

Client: Plaintiff Class

- Trial Testimony
- Deposition
- Expert Report

Meltzer, Lippe, Goldstein, et al. v. Advanced Fibre Communication, Inc.

Client: Advanced Fibre Communications, Inc.

- Expert Report

Kendall-Jackson Winery, Ltd. v. E. & J. Gallo Winery

Sullwold & Hughes and Cotchett & Pitre (1997)

Client: E. & J. Gallo Winery (Turning Leaf Vineyards)

- Trial Testimony
- Deposition
- Expert Report

Platte Chemical Co. v. Kenner Agricultural Manufacturing Co., et. al

Severson & Werson and Holland & Hart (1996)

Client: Platte Chemical Company

- Deposition

New City Corp., et. al v. Consolidated Land Co., et al.
Alden Aronovsky & Sax and Kimble MacMichael & Upton (1996)
Client: Community First Bank
• Deposition

Beazer East, Inc. v. CSX Transportation, Inc.
Babst Calland Clements & Zomnir (1996)
Client: Beazer East, Inc.
• Expert Report

Sprague v. Mikasaka, et al.
Townsend Townsend & Crew (1996)
Client: Well-Pict
• Trial Testimony
• Deposition

City of Fresno v. Quist Dairy
City of Fresno City Attorney's Office (1996)
Client: City of Fresno
• Deposition

Sanofi v. Cygnus Therapeutic Systems, Inc.
Brobeck Phleger & Harrison (1995, 1996)
Client: Cygnus Therapeutic Systems, Inc.
• Expert Report

Burns Philip v. Rykoff-Sexton
Pillsbury Madison & Sutro (1995, 1996)
Client: Burns Philip
• Binding Arbitration Testimony
• Deposition

In re: Brand Name Prescription Drugs Antitrust Litigation
Covington & Burling and Patterson Belknap Webb & Tyler (1995, 1996)
• Deposition
• Expert Report

Transamerica v. W.R. Grace
Ness Motley Loadholt Richardson & Poole (1995)
Client: Transamerica
• Deposition
• Preliminary Expert Report

W. D. Farming and Suma Fruit Co. v. Kemper Insurance (American Motorist)

McCormick Barstow Sheppard Wayte & Carruth (1995)

Client: Kemper Insurance (American Motorist)

- Arbitration Testimony

**City and County of Denver, et al. v. Alumet Partnership, et al. v. City of Aurora
Inman Flynn & Biesterfeld (1995)**

Client: Metro Wasterwater Reclamation District

- Deposition
- Expert Report

Nickel v. Bank of America National Trust and Savings Association, et al.

Mills Firm (1994-1996)

Client: Carol F. Nickel (Plaintiff Class)

- Deposition
- Expert Report
- Affidavit

**Consolidated Industries, Inc. (dba Frutec) v. Clovis Preserving Co. (dba Lyon
Magnus), et al.**

Kimble MacMichael & Upton (1994, 1995)

- Deposition

Potash Antitrust Litigation

Keller Rohrback and Meredith Cohen & Greenfogel (1994, 1995)

Client: Class of Direct Purchasers of Potash

- Deposition
- Supplemental Expert Report
- Expert Report
- Supplemental Affidavit
- Affidavit

Circo Craft Co., Inc. v. AMP-AKZO

Brobeck Phleger & Harrison (1994)

Client: Circo Craft Co., Inc.

- Deposition

Carbon Dioxide Antitrust Litigation

Burke Weaver & Prell and Bell Boyd & Lloyd (1994, 1995)

Client: BOC Group, Inc., Liquid Air Corp., Liquid Carbonic and Archer Darnfield Midland Co.

- Deposition
- Supplemental Expert Report
- Expert Report

City of Fresno v. Dow Chemical, Shell, Occidental, et al.

Consolidated DBCP Cases

Hardin Cook Loper Engel & Bergez and Sedgwick Detert Moran & Arnold (1994, 1995)

Client: Dow Chemical, Shell and Occidental

- Deposition

Proposed Customs Regulation Amendments Hearing

Pillsbury Madison & Sutro (1995)

Client: Pillsbury Co.

- Affidavit

In re: Belozor Farms, Inc. (dba Lynden Farms)

Irell & Manella (1994)

Client: Foster Farms

- Affidavit

Kawamata Farms, Inc. v. DuPont, et al.

Tomono, et al. v. DuPont, et al.

Goodsill Anderson Quinn & Stifel (1994)

Client: DuPont

- Trial Testimony
- Deposition

Carlough, et al. v. Amchem Products, Inc., et al. v. Admiral Insurance Co., et al.

Cozen & O'Connor (1994)

Client: Commercial Union Insurance Co., Safeco Insurance Co. of America and C.E. Health Compensation & Liability Insurance Co.

- Affidavit

Hillview Porter Arbitration

Munger Tolles & Olson (1994)

Client: Consortium of responsible parties including: Teledyne, Spectra Physics, Xerox Lockheed and Smith Kline

- Binding Arbitration Testimony

Helm Tomatoes, Inc. et al. v. Borden, Inc. et al.
Britz, Inc. v. Borden, Inc.
McCormick Barstow Sheppard Wayte & Carruth (1994, 1995)
• Deposition

Catfish Antitrust Litigation
McGrath North Mullin & Kratz (1993)
Client: Delta Pride, Country Skillet and Farm Fresh
• Class Certification Hearing Testimony
• Deposition
• Affidavit

Monsanto Co. v. Aetna Casualty & Surety Co., et al.
Orrick Herrington & Sutcliffe (1993)
Client: International Insurance Company
• Deposition

Clay White Associates v. Pet, Inc.
Ericksen Arbuthnut Brown Kilduff & Day (1993)
Client: Clau White Associates
• Deposition

David Cox v. GenCorp and Areojet General
Stamell Tabacco & Schager (1993)
Client: David Cox
• Expert Report

Mann v. Kemper Financial Companies, Inc. et al.
Cunniff v. Kemper Financial Companies, Inc. et al.
Jenner & Block
Barger & Wolen
Cotsirilos Stephenson Tighe & Streicker (1993)
Client: Kemper Financial Companies, Inc.
• Settlement Proceedings Testimony

Glen Ellen Winery v. Bronco Wine Co.
Damrell Nelson Shcrimp Pallios & Ladine (1993)
Client: Bronco Wine Company
• Trial Testimony
• Deposition

Class v. ConAgra, Inc., et al.

McGrath North Mullin & Kratz (1993)

Client: ConAgra, Inc.

- Deposition

Davilla v. Arrow Development Co., et al.

Munger Tolles & Olson

Client: Spectra-Physics and Teledyne

- Deposition

Mangini v. Areojet-General Corp., et al.

McCutchen Doyle Brown & Enesen (1992)

Client: Mngini Family

- Trial Testimony
- Deposition

City of Kingsburg, et al. v. Interlink Agricultural Chemical Co., et al

Hardin Cook Loper Engel & Bergez (1992)

Client: City of Sanger

- Trial Testimony
- Deposition

Mexican Citrus v. Bankers Trust

Dorsey & Whitney (1992)

Client: Bankers Trust

- Expert Report

Blue Bell v. Western Glove

Arnold & Porter (1992)

Client: Western Glove

- Trial Testimony

Burkhalter Travel Agency v. MacFarms Int'l, Inc., et. al

Specialty Food Distributions, Inc. v. MacFarms Int'l, Inc., et al.

Client: Mauna Loa Macadamia Nut Corp.

McCutchen Doyle Brown & Enersen (1991)

- Sur-Reply Declaration
- Declaration

Class v. Safeway Stores
Morrison & Foerster and King & Green (1990)
Client: Plaintiff Class
• Trial Testimony

Appendix LECG-B

ROBIN ANN CANTOR

Law & Economics Consulting Group, Inc.
1600 M Street, NW
Suite 700
Washington, D.C. 20036
Tel. (202) 973-9868
Fax (202) 466-4487
robin_cantor@dc.lecg.com

EDUCATION

Ph.D., Economics, DUKE UNIVERSITY, 1985.

Dissertation: An Analysis of Public Costs and Risks in the Canadian Nuclear Industry

Fields: Public Finance, International Economics, Econometrics

B.S., Mathematics, INDIANA UNIVERSITY OF PENNSYLVANIA, 1978.

PRESENT EMPLOYMENT

LAW & ECONOMICS CONSULTING GROUP, INC., September 1996 - present.

Managing Economist

PROFESSIONAL EXPERIENCE

NATIONAL SCIENCE FOUNDATION, Washington, D.C., 1992 - 1996.

Program Director, Decision, Risk, and Management Science

Responsible for complete coordination of mail review for approximately 200 grant proposals annually, panel review and functions, and allocation of \$4M program budget. Responsible for synthesis and communication of research areas for use within and outside of the research community. Developed several interdisciplinary research initiatives in organizational behavior and quality management, policy sciences, integrated assessment, and valuation which received separate funding through NSF, other agencies, and the private sector, totaling about \$23M in new resources in these areas.

NSF HUMAN DIMENSIONS OF GLOBAL CHANGE, 1992 - 1996.

Coordinator

Coordinator for the Methods and Models for Integrated Assessment, and Team Leader for the Decision Making and Valuation for Environmental Policy funding competitions.

Responsible for NSF and interagency coordination of approximately 180 proposals in environmental social science and allocation of \$6M budget. Lead author of a report on the federal programs in HDGC which became the basis for initiatives in the policy sciences and integrated assessment. Served as lead technical representative in environmental social

STB

FD-

33388

ID-184826

12-15-97

D

28/60

science for federal review activities and Office of Science and Technology Policy subcommittee functions.

JOHNS HOPKINS UNIVERSITY, 1996

Lecturer, Graduate Part-Time Program in Environmental Engineering and Science

OAK RIDGE NATIONAL LABORATORY

Research included several areas of environmental economics, risk management, public policy and societal decision making. Specific research also included Canadian and US nuclear policies and risk management, possibilities for cost-sharing arrangements between local jurisdictions and other government agencies to clean up hazardous waste sites, social and individual valuations of non-marketed goods, environmental externalities and energy technologies, private sector responses to global warming, and electric power plant cost estimation and planning. Primary funding sources included DOE, EPA, and FEMA.

Project Manager, November 1990 - December 1991.

External Costs of Fuel Cycles Project, an international study of externalities. Responsibilities included coordinating a project team of 25 people located at ORNL and Resources for the Future and managing a \$1M annual budget.

Technical Assistant, September 1989 - November 1990.

Assistant to the Associate Director for Advanced Energy Systems

Responsibilities included annual review of \$142M budget spanning four divisions (energy, fossil, chemical technology, and fusion) and hundreds of research projects.

Group Leader, June 1987 - July 1989.

Social Choice and Risk Analysis Group, Energy and Economic Analysis Section

Research Staff, October 1982 - June 1987.

Energy and Economic Analysis Section, Oak Ridge National Laboratory

HARVARD INSTITUTE FOR INTERNATIONAL DEVELOPMENT, July 1987.

Consultant

Indonesian Energy Project

NORTH CAROLINA CENTRAL UNIVERSITY, Durham, N. C., Spring 1982.

Visiting Instructor

JOURNALS AND BOOKS

"Risk, Stigma, and Property Values: What are people afraid of?" with Gregory D. Adams in *Risk and Stigma*, J. Flynn, H. Kunreuther, and P. Slovic, eds., forthcoming.

"Comments on the NEBA approach: Some reflections on the decision process," in *Restoration of Lost Human Uses of the Environment*, Grayson Cecil and Randa Luthi, eds., forthcoming.

"Economic Activity" chapter editor with Gary Yohe in *Human Choice and Climate Change: A International Social Science Assessment State of the Art Report*, S. Rayner and E.L. Malone, eds., Battelle Press, forthcoming.

"Rethinking Risk Management in the Federal Government," *The Annals of the American Academy of Political and Social Science*, 545, special editors H. Kunreuther and P. Slovic, 135-143, May 1996.

Estimating Externalities of Coal Fuel Cycles, Russell Lee, ed., Report 3, Utility Data Institute, McGraw-Hill, Washington, DC, 1994.

"Changing Perceptions of Vulnerability," with Steve Rayner in *Industrial Ecology and Global Change*, R. Socolow, C. Andrews, F. Berkhout, and V. Thomas, eds., Cambridge University Press, 1994.

"Risk and Rationality in Hazardous Waste Disposal: Ethnography and Contingent Valuation," with Mark Schoepfle, *The Environmental Professional*, 15, special issue on *Communities at Risk: Communication and Choice of Environmental Hazards*, A. K. Wolfe and E. B. Liebow, eds., 293-303, 1993.

Making Markets: An Interdisciplinary Perspective on Economic Exchange, with Stuart Henry and Steve Rayner, Greenwood Press, Delaware, 1992.

"The Potential Role of Nuclear Power in Controlling CO₂ Emissions," with W. Fulkerson, John Jones, Jerry Delene, and Alfred M. Perry, in *Limiting the Greenhouse Effect: Options for Controlling Atmospheric CO₂ Accumulation*, G. I. Pearman, ed., John Wiley and Sons, 1992.

"Sources and Consequences of Hypothetical Bias in Economic Analysis of Risk Behavior," with Mark Schoepfle and Ellen Szarleta, in B. John Garrick and Willard C. Gekler, eds., *The Analysis, Communication, and Perception of Risk*, Plenum Press, New York, 1991.

"Applying Construction Lessons to Decommissioning Estimates," *The Energy Journal*, 12, special issue edited by M. J. Pasqualetti, 105-117, 1991.

"Biomass Energy: Exploring the Risks of Commercialization," with Colleen Rizy, *Bioresource Technology*, 35(1), 1-13, 1991.

"Beyond the Market: Recent Regulatory Responses to the Externalities of Energy Production," with Alan Krupnick and Colleen Rizy, in *Proceedings of the 1991 Conference of the National Association of Environmental Professionals*, pp. 51-61, 1991.

"Thinking the Unthinkable: Preparing for Global Disaster," with S. Rayner, in P. Ricci (ed.), *New Risk: Issues in Management*, Plenum Press, New York, 1990.

"Policies to Encourage Private Sector Responses to Potential Climate Change," with Don Jones, Paul Lieby, and Steve Rayner, in A. Finizza and J.P. Weyant, eds., *Energy Markets in the 1990s and Beyond*, IAEE, Washington, D.C., 1989.

"The Economics of Nuclear Power: Some New Evidence on Learning, Economies of Scale, and Cost Estimation," with Jim Hewlett, in *Resources and Energy*, 10, 315-335, 1988.

"L'Approche Culturelle aux Choix Technologiques de la Societe," with S. Rayner, in D. Duclos, ed., *La Societe Vulnérable*, Ecole Normale Supérieure, Paris, 1987.

"The Role of Liability Preferences in Societal Technology Choices: Results of a Pilot Study," with S. Rayner and R. B. Braid, in L. Lave, ed., *Risk Assessment and Management*, Plenum Press, New York, 1987.

"How Fair is Safe Enough? The Cultural Approach to Societal Technology Choice," with S. Rayner, *Risk Analysis: An International Journal*, 7(1), 3-9, 1987.

"Evaluation of a Large-Scale Charcoal Project in Madagascar: Attacking the Deforestation Problem from the Supply-Side," with C. Petrich and J. R. Mercier, in David O. Wood, ed., *The Changing World Energy Economy*, IAEE, Washington, D.C., 1987.

"The Fairness Hypothesis and Managing the Risks of Societal Technology Choices," with S. Rayner, *ASME*, paper 86-WA/TS-5, December 1986.

"Regulatory Trends and Practices Related to Nuclear Reactor Decommissioning," in John P. Weyant and Dorothy B. Sheffield, eds., *The Energy Industries in Transition 1985 - 2000*, IAEE, Washington, D.C., 1984.

REPORTS

"Community Preferences and Superfund Responsibilities," prepared for the USEPA under Interagency Agreement 1824-B067-A1 with Oak Ridge National Laboratory, August 1993.

The U.S.-EC Fuel Cycle Study: Background Document to the Approach and Issues, with L. W. Barnhouse, D. Burtraw (Resources for the Future), G. F. Cada, C. E. Easterly, A. M. Freeman (Bowdoin College), W. Harrington (Resources for the Future), T.D. Jones, R. L. Kroodsma, A. J. Krupnick (Resources for the Future), R. Lee, H. Smith (DOE), A. Schaffhauser, and R. S. Turner, Oak Ridge National Laboratory, ORNL/M-2500, November, 1992.

"What are the Problems of Equity and Legitimacy Facing a Management Strategy for the Global Commons?" with Roger Kasperson in Steve Rayner, Wolfgang Naegeli, and Patricia Lund, *Managing the Global Commons: Decision Making and Conflict Resolution in Response to Climate Change*, Oak Ridge National Laboratory, ORNL/TM-11619, July, 1990.

Markets, Distribution, and Exchange After Societal Cataclysm, with S. Rayner and S. Henry, Oak Ridge National Laboratory, ORNL-6384, November, 1989.

"Information," with G. G. Stevenson and P. J. Sullivan, Chapter 5 of *A Compendium of Options for Government Policy to Encourage Private Sector Responses to Potential Climate Change*, DOE/EH-0102, Report to Congress, October, 1989.

"Agriculture and Forestry," with W. Naegeli and A. F. Turhollow, Jr., Chapter 10 of *A Compendium of Options for Government Policy to Encourage Private Sector Responses to Potential Climate Change*, DOE/EH-0102, Report to Congress, October, 1989.

Evaluation of Implementation, Enforcement, and Compliance Issues of the Bonneville Model Conservation Standards Program, Vol. I and II, with Steve Cohn, ORNL/CON-263, July, 1989.

Gas Furnace Purchases: A Study of Consumer Decision Making and Conservation Investments, with David Trumble, ORNL/TM-10727, October, 1988.

An Analysis of Nuclear Power Plant Construction Costs, with J. G. Hewlett and C. G. Rizy, DOE/EIA-0485, 1986.

Nuclear Reactor Decommissioning: A Review of the Regulatory Environments, ORNL/TM-9638, 1986.

Nuclear Power Options Viability Study, Vol. I, Executive Summary, with D. B. Trauger et al., ORNL/TM-9780/1, 1986.

Nuclear Power Options Viability Study, Vol. III, Nuclear Discipline Topics, with D. B. Trauger et al., ORNL/TM-9780/3, 1986.

Clinch River Breeder Reactor: An Assessment of Need for Power and Regulatory Issues, with D. M. Hamblin et al., ORNL/TM-8892, September 1983.

OTHER PUBLICATIONS

"Decision Analysis," contributing author to edited chapter, C.C. Jaeger, O. Renn, E. A. Rosa, and T. Weblar, G. McDonell, and G. Serger, eds., in *Human Choice and Climate Change: A International Social Science Assessment State of the Art Report*, S. Rayner and E.L. Malone, eds., Battelle Press, forthcoming.

Book review of *Public Reactions to Nuclear Waste* by Riley E. Dunlap, Michael E. Kraft, and Eugene A. Rosa, *Science*, 266, p. 145, Oct. 1994.

"News from Washington," *Human Dimensions Quarterly*, 1(2), 20-21, Fall 1994.

Book review of *The Risk Professionals* by Thomas M. Dietz and Robert W. Rycroft, *The Environmental Professional*, 11(4), 458-9, 1989.

"Decommissioning: The Next Chapter in the Nuclear Saga," in *FORUM*, 3(3), 105-106, invited letter to the Editor, 1988.

SELECTED PRESENTATIONS

"Natural Resource Damage Rules: A Search for the Path of Least Resistance in Value Disputes?" George Washington University Seminar Series on Environmental Values and Strategies, September, 1997.

"Rethinking the Science of Risk Management: Changing paradigms of the process and function," Operations and Information Management Department Workshop, Wharton School of the University of Pennsylvania, November, 1995.

"Interdisciplinary Perspectives on Experimental Methods," presented with Hal Arkes at the 1995 Meetings of the American Economic Association, January 1995.

"Risk Management: Four different views," invited presentation to the Conservation of Great Plains Ecosystems Symposium, April, 1993.

"Human Dimensions of Global Change: A white paper on the USGCRP research programs," presented to the National Academy of Sciences Board on Global Change, November 1993.

"Changing Perceptions of Vulnerability," invited paper presented with Steve Rayner at the NCAR/UCAR Summer Institute on Industrial Ecology and Global Change, July 17-31, 1992.

"Should Economic Considerations Limit the Conservatism of Risk Assessment?" invited paper presented at the Workshop of the International Society of Regulatory Toxicology and Pharmacology on Risk Assessment and OMB's Report on its Application in Regulatory Agencies, Washington, D.C., June 11, 1991.

"Beyond the Market: Recent Regulatory Responses to the Externalities of Energy Production," presented at the Annual Meetings of the National Association of Environmental Professionals, Baltimore, MD, April 30, 1991.

"Understanding Community Preferences at Superfund Sites," presented at the National Meeting of EPA Community Relations Coordinators, Chicago, Illinois, April 4-6, 1990.

"Methodological Myths and Modeling Markets: A Common Framework for Analyzing Exchange," presented at the Second Annual International Conference on Socio-Economics, Washington, D.C., March, 1990.

"Sources and Consequences of Hypothetical Bias in Economic Analyses of Risk Behavior," with G. M. Schoepfle and E. J. Szarlata, presented at the 1989 Meetings of Society for Risk Analysis, October 1989.

"Policies to Encourage Private Sector Responses to Potential Climate Change," with Don Jones, Paul Lieby, and Steve Rayner, presented at the 1989 Meetings of International Association of Energy Economists, October 1989.

"The Experimental Approach in Public Policy Analysis: Precepts and Possibilities," with Ellen J. Szarlata, presented at the Public Choice Society and Economic Science Association Annual Meetings, Orlando, Florida, March 17-19, 1989.

"Global Disaster Management: Developing Principles for Research," with Steve Rayner, presented at the 1988 Meetings of the Association for Public Policy Analysis and Management, October 1988.

"Implementation and Enforcement Issues from Early Adopter Experience," meeting of the Regional Evaluation Network, Northwest Power Planning Council, Portland, Oregon, June, 1988.

"Using Information from Toxic-Tort Litigation to Value the Health and Safety Consequences of Regulatory Decisions," Public Policy Workshop, the Department of Economics and Waste Management Research and Education Institute, University of Tennessee, Knoxville, February, 1988.

"Valuing Safety and Health Effects in Regulatory Decisions: A Revealed-Preference Approach," with R. Bishop Jr., presented at the 1987 Annual Meeting of the Society for Risk Analysis, November 3, 1987.

"Government Intervention and Technology Prices: The CANDU Example," invited paper presented at the WATTEC Conference, February 19, 1987, Knoxville, Tennessee.

"Fairness Hypothesis and Managing the Risks of Societal Technology Choices," with S. Rayner, presented at the 1986 Winter Annual Meeting of the American Society of Mechanical Engineers, Anaheim, California, December 10-12, 1986.

"A Retrospective Analysis of Technological Risk: The Case of Nuclear Power," invited paper presented in the Center of Resource and Environmental Policy Workshop Series, Vanderbilt University, Nashville, Tennessee, December 4, 1986.

"Evaluation of a Large-Scale Charcoal Project in Madagascar: Attacking the Deforestation Problem from the Supply Side," with Carl Petrich and Jean-Roger Mercier, presented at the 1986 IAEE North American Conference, Cambridge, Massachusetts, November 19-21, 1986.

"Tools for the Job: Choosing Appropriate Strategies for Risk Management," with S. Rayner, presented at the 1986 Annual Meeting of the Society for Risk Analysis, Boston, Massachusetts, November 9-12, 1986.

"Thinking the Unthinkable: Preparing for Global Disaster," with S. Rayner, presented at the 1986 Annual Meeting of the Society for Risk Analysis, Boston, Massachusetts, November 9-12, 1986.

"The Role of Liability Preferences in Societal Technology Choices: Results of a Pilot Study, with S. Rayner and B. Braid, presented at the 1985 Annual Meetings of Society for Risk Analysis, Washington, D.C., October 8, 1985.

CONFERENCE PARTICIPATION

Organizing Committee Member for the 1997 Annual Meetings of the Society for Risk Analysis.

Panelist for Net Environmental Benefits Assessment for Restoration Projects After Oil Spills, Conference on Restoration of Lost Human Uses of the Environment, Washington DC, May 1997.

Session Organizer and Chair for Cost Benefit Analysis and Risk Assessment at the 1996 Annual Meeting of the Society for Risk Analysis.

Organizing Committee Member for the 1996 Annual Meetings of the Society for Risk Analysis.

Panelist for Challenges in Risk Assessment and Risk Management, sponsored by The Annenberg Public Policy Center of the University of Pennsylvania at the National Press Club, Washington, DC, May 16, 1996.

Panelist for Media and Risk in a Democracy: Who Decides What Hazards Are Acceptable? at the 1995 Annual convention of the Association for Education in Journalism and Mass Communication.

Session Organizer and Co-Chair for Experimental Methods: Insights from Economics and Psychology at the 1995 Meetings of the American Economic Association.

US Organizer for the Third Japan-US Workshop on Global Change Modeling and Assessment: Improving Methodologies and Strategies, Hawaii, October, 1994.

Cluster Organizer for three sessions on Competitiveness at the Fall Meeting of the Operations Research Society of America/ The Institute of Management Sciences, 1994.

Roundtable Panelist for Risk Communication Research: Defining Practitioner Needs at the 1994 Meetings of the Society for Risk Analysis.

Workshop Organizer for Organizational Transformation and Quality Systems, National Science Foundation, 1993.

Session Chair and Organizer for the NSF/Private Sector Research Initiative Projects at the 1992 Meetings of the Society for Risk Analysis.

Roundtable Panelist for the EPA Session on Risk Communication at the 1990 Meetings of the Society for Risk Analysis.

Session Chair and Organizer for the Computer Assisted Market Institutions Session at the Advanced Computing for the Social Sciences Conference, April 1990.

Discussant for the Issues in LDC Public Finance Session at the 1988 Meetings of the American Economic Association.

Session Chair and Organizer for Social Science Innovations in Risk-Analysis Methods, Special Session at the 1988 Meetings of the Society for Risk Analysis.

PROFESSIONAL ACTIVITIES

Advisory Board Member, Johns Hopkins University Graduate Part-Time Program in Environmental Engineering and Science, three year term beginning 1997.

Editorial Board, *Journal of Risk Analysis*, three year term beginning 1997.

Advisory Committee Member, Harvard Center for Risk Analysis, 1997.

Editorial Board, *Journal of Risk Research*, 1997.

Planning Committee Member, Carnegie Council on Ethics and International Affairs Long Term Study of Culture, Social Welfare, and Environmental Values in the US, China, India, and Japan, initiated January 1997.

Councilor, Society for Risk Analysis, three-year term beginning in 1996.

Vice-Chair, US Global Change Research Program working group on Assessment Tools and Policy Sciences, 1994-1996.

US Federal Reviewer for the Intergovernmental Panel on Climate Change working group III 1995 Report on Socioeconomics.

NSF Principal for the Committee on the Environment and Natural Resources' Subcommittee on Risk Assessment, 1993-1996. I also served as the liaison between the Subcommittee on Risk Assessment and the Subcommittee on Social and Economic Sciences.

Advisory panel member for Environmental Ethics and Risk Management, National Academy of Public Administration and George Washington University, 1993-4.

Science Advisory Board member for Consortium for International Earth Science Information Network, 1993.

Review Panel member for Economics and the Value of Information, NOAA, 1993.

NSF technical representative to the FCCSET Ad Hoc Working Group on Risk Assessment and member of its Subcommittee on Risk Assessment, 1992-3.

NSF representative to Working Party of the FCCSET Subcommittee for Global Change Research on Assessment, 1992-3.

Membership in professional societies: Society for Risk Analysis.

Affirmative Action Representative for the Energy Division, Oak Ridge National Laboratory 1984-89, AA Rep for the Central Management Organization of ORNL, October 1989 to November 1990.

Board of Directors, Vice President (1987-88), President (1988-89), Matrix Organization, The Business Center for Women and Minorities, Knoxville, Tennessee.

Referee for: *Climate Change*, *Contemporary Economic Policy*, *Growth and Change*, *Ecological Applications*, *Risk Analysis*, Duke University Press, Princeton University Press, *J. of Environmental Economics and Management*, *Resources and Energy*, *The Environmental Professional*, National Science Foundation, National Oceanic and Atmospheric Administration, *FORUM*, U.S. Environmental Protection Agency.

AWARDS

NSF Director's Award for Superior Accomplishment, 1996
NSF Special Act Award, 1995
NSF Director's Award for Program Officer Excellence, 1994
Oak Ridge National Laboratory Significant R&D Accomplishment Award, 1993
YWCA Tribute to Women Award for Business and Industry, 1990
Martin Marietta Special Achievement Award, 1990
Martin Marietta Special Achievement Award, 1989
Martin Marietta Energy Systems Significant Event Award, 1988

SCHOLARSHIPS

C. B. Hoover Scholar, 1980 - 1981
Mellon Fellowship, 1978 - 1981

November 1997

Appendix LECG-C

Materials Relied Upon

Harvey, Aviva E. et al. *Statistical Trends in Railroad Hazardous Materials Transportation Safety 1978 to 1986*. Association of American Railroads Pub. No. R-640, 1987.

Barkan, Christopher P. L. *Data Requirements for the Development of a Quantitative Risk Assessment Model for Rail Transportation of Hazardous Materials*. Conference on the Transportation of Hazardous Materials and Wastes, 1991.

CSX Transportation, Inc. *Safety Assurance and Compliance Program Report/Executive Summary*, N.p., n.d.

Electronic Data Files received from Zeta Tech:

- 1995 MoW OE FRA ZetaTech.xls
- crtrack.xls
- crtraffic96.xls
- csxcrv.xls
- nsdata.xls
- Zeta Tech.xls
- ZT FRA Detail Segment Grade.xls
- ZT FRA Shop Facilities.doc
- ZT FRA Summary Segment Grade.xls
- ZT FRA Traffic GTMs.xls
- ZT FRA TSC 94 96 2.xls
- ZT FRA Turnouts.xls
- FRA_Zeta-Tech study 9_30.xls
- Hazmat 95.xls
- Zeta_per.txt
- CRACD89.xls - 96.xls
- CSXACD89.xls - 96.xls
- NSACD89.xls - 96.xls

English, Edward R. Verified Statement Finance Docket No. 33388, Oct. 17, 1997.

FRA Depository Index, STB Finance Docket No. 33388:

- Accidents - CR, CSX, NS
- Background Material (Hazardous Materials, Dispatch Centers, Highway Grade Crossing, Operating Practices, Track and Structures, Signal and Train Control, Analytical Modeling, Bridges and Tunnels)
- UP/SP Safety Assessment/Survey (July/Aug. 1997)
- UP/SP Safety Assessment Interim Report/Executive Overview
- VRE Various Public Items

GAO *Rail Transportation: Federal Railroad Administration's New Approach to Railroad Safety*. Pub. No. GAO-RCED-97-142, July 1997.

Green, William H. *Econometric Analysis*, 2d ed. 1993.

Appendix LECG-C

Hard Copy Data Files received from Zeta Tech:

CR Line Segments - Base Case and Post Acquisition Case

NS Line Segments - Base Case and Post Acquisition Case

CSX Line Segments - Base Case and Post Acquisition Case

Hofstede, Geert et al. *Measuring organizational cultures: a qualitative and quantitative study across twenty cases*. Admin. Sci. Q. 35, 1990.

Maurino, Daniel E. et al. *Beyond Aviation Human Factors: Safety in High Technology Systems*, 1995.

Moore, Thomas G. "The Myth of Deregulation's Negative Effect on Safety," in *Transportation Safety in An Age of Deregulation*, eds. Leon N. Moses and Ian Savage, 1989.

Oster, Clinton V. et al. *Why Airplanes Crash: Aviation Safety in A Changing World*, 1992.

Railroad Control Application. Finance Docket No. 33388, June 1997.

Reason, James. *Corporate Culture and Safety*, NTSB Symposium on Corporate Culture and Transportation Safety, 1997

Rose, Nancy L. "Financial Influences on Airline Safety," in *Transportation Safety in An Age of Deregulation*, eds. Leon N. Moses and Ian Savage, 1989.

Thompson, R.E. et al. *Hazardous Materials Car Placement In A Train Consist - Vol. 1 (Review and Analysis)*. U.S. Dep't of Transportation Report No. DOT/FRA/ORD-92/18.1, 1992.

U.S. Dep't of Transportation. *Accident Incident Bulletin*. Federal Railroad Administration Office of Safety, 1992-97.

U.S. Dep't of Transportation. *Enhancing Rail Safety Now and into the 21st Century: the Federal Railroad Administration's Safety Programs and Initiatives*. Federal Railroad Administration, 1996

U.S. Dep't of Transportation. *Preliminary Comments*. Finance Docket No. 33388, Oct. 21, 1997.

Viscusi, Kip. "The Effect of Transportation Deregulation on Worker Safety," in *Transportation Safety in An Age of Deregulation*, eds. Leon N. Moses and Ian Savage, 1989.

REBUTTAL VERIFIED STATEMENT

OF

DONALD K. REARDON

President

The Baltimore and Ohio Chicago Terminal Railroad Company

My name is Donald K. Reardon. I am President of The Baltimore and Ohio Chicago Terminal Railroad Company (B&OCT), a wholly-owned subsidiary of CSX Transportation, Inc. (CSXT). I have held the position since March 1996. My offices are at the B&OCT Barr Yard in Riverdale, Illinois. I am responsible for all operations on the B&OCT as well as CSXT operations in and out of the Chicago Terminal over the B&OCT. I have been in the railroad industry for 33 years, having held various marketing, operations, and general management positions at CSXT and/or its subsidiaries and at predecessor companies.

B&OCT operates in the Chicago Terminal Area. One of the difficulties in making the Chicago Terminal flow smoothly is difficulty in communication. A single train must often traverse several carriers' lines to get to the destination yard or to pass through Chicago. Each line is generally dispatched by its owner. Dispatchers for different roads typically have not coordinated their efforts with one another. We are concentrating on communication at B&OCT. To help reduce the inefficiencies that follow from lack of communications, in January 1997, B&OCT relocated its dispatchers to the Belt Railway of Chicago's (BRC) Clearing Yard where they are now co-located with BRC dispatchers. Merely being in the

same dispatching complex has improved coordination between these two teams. This is the sort of cooperation between railroads that I believe it is useful to have.

However, the main purpose of this verified statement is to address two subjects raised in the responsive application of the Wisconsin Central (WC) seeking to force the sale of B&OCT's Altenheim Subdivision to WC. I will first address the implications of the proposed forced sale of the Altenheim Subdivision on the existing industrial customers served by B&OCT on that line. I will then address the complaints about B&OCT dispatching which WC has raised as its justification for the proposed forced sale. I understand that Mr. John Orrison has addressed the operating implications of the WC proposal in his verified statement.

The B&OCT serves thirty-five local industries. These industries rely on B&OCT to pick up and deliver freight from their door and to deliver their traffic to line-haul railroads serving the Chicago area. Eleven of these thirty-five customers are located on the Altenheim Subdivision. From B&OCT's viewpoint, these customers represent approximately one-third of our industrial customer base. From the perspective of our customers on the Altenheim subdivision, B&OCT is their link to the national rail network. (Other railroads who use our switching services and facilities are the other category of B&OCT customers.)

B&OCT provides five day a week local switching service to the industries on the Altenheim Subdivision. One train is dedicated to that job each day. That train also interchanges with the St. Charles Air Line Railroad and Manufacturers Junction Railroad.

Wisconsin Central's Application makes it clear that its attempt to take over this line is designed solely for overhead service. It has given no indications of its intentions with respect to local service except to indicate that B&OCT would be granted local trackage rights to serve the existing customers. Since very little of these customers' shipments are destined to points on the WC, one would not expect Wisconsin Central to place a high priority on local service to these customers. Under WC ownership, the train operated daily by B&OCT to pick up and deliver freight for these customers would be subordinated in importance to the overhead movements that WC makes over the line. Since local switching operations take longer than overhead movements, I am concerned that service to these customers would suffer badly. Today, except when B&OCT is working those local industries, there is essentially no traffic on the Altenheim subdivision to interfere with the WC's operations. If a sale were forced, I am certain that WC's traffic will take priority. It will be harder to fit in a local switch job between WC's through trains than it is to fit W's trains around the single B&OCT local.

The area served by the Altenheim Subdivision is an economically depressed region and over the past two decades has declined somewhat. In the long run, there is considerable potential for industrial development along the corridor and it would certainly discourage industry from locating on the line if the owner had no interest in local service.

I would like next to address the complaints about B&OCT dispatching raised by WC. The overall tenor of the WC's submission on the subject of dispatching is that B&OCT selectively mistreats WC out of a combination of neglect and vindictiveness. This is both

false and insulting. It is true that WC is denied access to the Altenheim Subdivision while the B&OCT local switch crew is delivering and picking up freight from the customers on that line. Safe operations require nothing less. When B&OCT trains are not on the line, WC has full use of it and the only interfering train traffic is WC's own trains. Stripped of the rhetoric, WC's complaint is one that could be repeated throughout the Chicago Terminal by many carriers including B&OCT and CSXT: It can be difficult to maintain continuous train movement over various routes in and through Chicago. CSXT recognizes this and is investing tens of millions of dollars to improve traffic flow and velocity through the terminal by providing more route options on B&OCT and other carriers in and through Chicago.

The lengthy complaint of WC about dispatching problems on a particular day in October 1997 mostly boils down to two problems: the difficulty of coordinating right of way maintenance and train operations, and difficulties in communication. In fact, WC is often to blame for its own operating difficulties. The B&OCT local service on the Altenheim Subdivision is scheduled and operates Monday through Friday from 0800 to 1800 CST. This schedule is known to WC. WC could, and should, schedule its traffic to avoid potential conflict between this local switching operation and its trackage rights trains. The majority of WC's trains over the Altenheim Subdivision are nonscheduled unit trains of bulk commodities. WC often attempts to squeeze a train through during this local's work -- which B&OCT can sometimes accommodate while the local is working on the 48th St. branch. However, the timing of that part of the local's work is never certain and WC is

essentially taking a chance that an opportunity to move across the Altenheim Subdivision may present itself.

The fact of the matter is that Chicago is a complex and congested terminal. There are hundreds of opportunities every day for delay throughout the Chicago Terminal as one train waits on dispatching clearance from another carrier over a line on which it operates.¹ While WC may experience delays in getting clearance to enter and exit the Altenheim Subdivision, B&OCT frequently has problems securing clearance to enter and exit the IHB and BRC. Interlockings that must be crossed are a major source of operating headaches in Chicago, too. CSXT has similar problems navigating through the complex network we call Chicago. Communications failures and mistakes by individual dispatchers are certainly part of this problem, but fundamentally it is the inherent nature of the operations through the Chicago Terminal with multiple carriers dispatching their own and others' trains from one line to the next that is the primary problem. We are currently setting up a dedicated direct communications link among local B&OCT, BRC, IHB and UP dispatchers. This will enable these dispatchers to more efficiently coordinate train movements in and through Chicago. Federal realignment of ownership of lines (and therefore dispatching control) that may help one carrier, but to the detriment of another who happens to own the property, will not change this fundamental nature of terminal operations.

¹ A carrier can operate over another via trackage rights or, also by agreement, to effect interchange.

I am aware of nothing in the CSX Operating Plan for post-control implementation that will adversely affect Wisconsin Central's operations onto, off of, or over the Altenheim Subdivision in any way at all.

Finally, in response to WC's vague assertion that it has an interest in clearing the subdivision for double stack intermodal moves, I would like to note that no one from Wisconsin Central has ever approached me regarding the possibility of increasing clearances on the Altenheim Subdivision.

VERIFICATION

I, Donald K. Reardon, declare under penalty of perjury that the foregoing is true and correct. Further, I certify that I am qualified and authorized to file this verified statement. Executed on December 9, 1997.

Donald K Reardon

**REBUTTAL VERIFIED STATEMENT
OF
PAUL H. REISTRUP**

I. INTRODUCTION

My name is Paul H. Reistrup. I am currently Vice President-Passenger Integration of CSX Transportation, Inc., a position that I have held since July 1, 1997. After graduating from the United States Military Academy at West Point and service in the Army, I began my railroading career in 1957 when I joined the Baltimore and Ohio Railroad (the "B&O"). While at the B&O, I had extensive involvement with both freight operations and passenger rail operations in my positions as Assistant Division Engineer (which included responsibility for intercity passenger train infrastructure), General Yardmaster, Trainmaster (which included responsibility for commuter and intercity passenger train operations), Superintendent of Car Utilization and Distribution (including passenger cars), Director of Passenger Service, and Assistant to the Vice President-Executive Department. From 1967 through 1975, I worked for the Illinois Central Gulf Railroad, serving as Vice President-Passenger Services, Vice President-Intermodal, and Senior Vice President-Traffic. From 1975 through 1978, I served as the President and CEO of the National Railroad Passenger Corporation ("Amtrak"). Since 1978, I have held additional positions including Chief Traffic Officer and then President and CEO of the Monongahela Railway Company (1982-92), General Manager of Privatization (responsible for privatization of two Argentine railroads) for the Railroad Development Corporation (1992-94), and Vice President and Program Area Manager for Parsons Brinckerhoff (1994-97).

As Vice President-Passenger Integration at CSX, my responsibilities include overseeing CSX passenger operations, negotiating contracts with passenger agencies, ensuring the safe and efficient use of CSX lines by both freight and passenger trains, and educating CSX staff in issues arising from the joint use of CSX lines by both freight and passenger trains. In addition, A.R. Carpenter, CSXT's President and Chief Executive Officer, has asked me to ensure the smooth integration, from both a safety and operations standpoint, of passenger trains into the new CSX rail network that will be created if the Board approves the Transaction. We have addressed passenger operations in the Operating Plan (Volume 3A) and Environmental Report (Volume 6A) submitted with the Application and, again, in the Safety Integration Plan submitted to the Board on December 3, 1997.

CSX is no stranger to passenger operations. CSX has been operating passenger trains for Maryland Rail Commuter ("MARC") for years. Amtrak operates its own passenger trains and the passenger trains of Virginia Railway Express ("VRE") over CSX lines. CSX also shares a line with Tri-Rail in the Miami area and controls an interlocker in Chicago used by commuter trains of the Commuter Rail Division of the Regional Transportation Authority of Northeast Illinois ("Metra"). After the transaction, CSX will, in addition, share lines with the Massachusetts Bay Transit Authority ("MBTA"), the Metro North Commuter Railroad ("Metro North"), New Jersey Transit Rail Operations ("NJT"), and the Southeastern Pennsylvania Transportation Authority ("SEPTA").

After CSX, NS, and Conrail filed their Application seeking Board approval of the proposed Transaction, I arranged meetings with every passenger agency that currently shares or will share lines with CSX as a result of the transaction. The purpose of these meetings

was to explain the Application to the passenger agencies, answer questions about the Application, identify concerns of the passenger agencies about the Application, and express CSX's commitment to work in conjunction with the passenger agencies to ensure that the Transaction would benefit the users of both freight and passenger rail services. Our relations with passenger agencies, like those of Conrail and other freight railroads, is governed by agreements that are the product of commercial negotiations, rather than government dictate. This is the atmosphere in which we have worked with commuter agencies for many years, and intend to continue to do so. As a former President of Amtrak, I bring to the table a solid understanding of passenger operations and of the legitimate interests of commuter agencies. I am confident that all of the issues raised by Amtrak and the commuter agencies can be resolved through commercial negotiation.

In fact, I am happy to report that our meetings, and subsequent negotiations, have resulted in the execution of a new contract with the Maryland Mass Transit Administration to continue operating MARC and an agreement with the Commonwealth of Massachusetts which addresses the interests of MBTA. The new contract with MARC provides for new service to Frederick, Maryland on a line that, until this time, had been used exclusively for freight operations. The agreement regarding MBTA includes, among other things, CSX's willingness to discuss with MBTA certain extensions of commuter rail services. Discussions with Metro North resulted in the mutual understanding that CSX will be able to take over Conrail's operations on lines shared with Metro North without difficulty. No formal agreement was required to memorialize this understanding.

My meetings with Amtrak, Metra, NJT, Septa and VRE were also productive on many fronts, although they have not yet achieved a resolution of all issues. As explained in more detail below, the issues that prevented complete agreement do not arise out of legitimate operational concerns related to the Transaction. Rather, they appear to be an effort to use the STB approval process as leverage to obtain concessions unrelated to the Transaction that the passenger agencies know they could not obtain either under their existing contracts with Conrail and CSX or through the normal process of arm's-length negotiation with either railroad.

CSX is committed to the smooth and safe integration of freight and passenger operations on its lines and on the Conrail lines over which it will operate post-Transaction. CSX has always worked to ensure that all trains operating over its lines (whether freight or passenger trains) operate in the safest and most efficient manner possible. It is simply not in CSX's interest to set a lower standard.

Given this commitment on the part of CSX, I was surprised by the tone and substance of many of the filings submitted by passenger agencies. As I demonstrate below, the Transaction will not adversely affect any of the passenger agencies which have requested conditions from the Board. Rather, the Transaction will create operating efficiencies and the opportunity for infrastructure improvements which will benefit both CSX and the passenger agencies.

II. RESPONSE TO COMMENTS OF SPECIFIC PASSENGER AGENCIES

A. National Railroad Passenger Corporation (Amtrak)

Amtrak expresses concern about CSX's use of the Northeast Corridor (the "NEC"), but does not ask the Board to take any action in this regard. Amtrak also asks the Board to impose two conditions on CSX related to CSX's off-corridor operations. First, Amtrak requests that the Board impose a "five-year oversight condition to consider appropriate remedies for any degradation in the on-time performance of the CSX-operated Amtrak trains that is traceable to increased freight traffic resulting from the proposed transaction." NRPC-7 at 11-13. Second, Amtrak requests that the Board impose a condition on CSX "requiring it to cooperate with Amtrak and the State of New York in the development of high speed service at public expense between Albany and Buffalo." *Id.* at 13-14

As a former President of Amtrak, I understand the organization and its interests very well. I am confident that all outstanding issues between CSX and Amtrak can be worked out without any involvement by the Board.

1. Northeast Corridor

The NEC was owned by Conrail or its predecessors prior to 1976 when, during my tenure as President of Amtrak, Conrail conveyed the NEC to Amtrak in accordance with the Final System Plan under the Regional Rail Reorganization Act of 1973. Conrail retained a Freight Service Easement over the NEC. A separate Agreement between Conrail and Amtrak, the Second Amended and Restated Northeast Corridor Freight Operating Agreement, dated October 1, 1986, now governs Conrail's exercise of its freight easement over the NEC.

CSX and NS propose to take over Conrail's operations over the NEC when they obtain control following approval, and, as soon as feasible thereafter, to implement the Operating Plans set forth in the Application. Under the NEC Freight Operating Agreement, Conrail has the right to modify its scheduled and unscheduled freight service "subject to the physical limitations of the NEC, to Amtrak's speed, weight and similar operating restrictions and rules or safety standards, and to the needs of, and in particular to the adequacy, safety and efficiency of, Amtrak passenger train operations and commuter service." Sections 2.3(b) and (c). Because the Operating Plans of CSX and NS each propose to change the numbers and schedules of freight trains operating over the NEC, they are negotiating their proposals with Amtrak.

Based on my discussions, I concur with Amtrak's stated expectation that all issues relating to use of the NEC will be resolved through negotiation. I am hopeful that the parties will be able to find a solution that will ensure continued safe freight operations on the NEC, consistent with each parties' needs and goals.

2. Amtrak's On-Time Performance

Amtrak's primary complaint is about CSX's historical on-time performance record, a matter that is not transaction-related. Although it is not fairly expected that Amtrak's on-time performance over CSX will be as high as that of other carriers who may host Amtrak trains over shorter distances or less complex routes,¹ CSX acknowledged before I joined the

¹ As small delays accumulate throughout a trip, the cumulative delay more often becomes significant on a longer trip than on a shorter trip. Even if the contract performance formulae were the same among all the railroads measured (which has not been demonstrated) it is misleading and inappropriate for Amtrak to use cumulative overall national averages to compare railroads in this manner because of important differences in: distances traveled;

railroad that there was some room for improvement in its service to Amtrak. As discussed below, on-time performance figures began to improve before I became involved and have continued to improve through 1997.

The on-time performance statistics that Amtrak presented to the Board were not computed consistent with the provisions of Amtrak's contract with CSX governing incentive payments (Appendix V). The on-time performance statistics presented by Amtrak do not take into account the reasons for delays to Amtrak trains. While such a methodology may be useful to an Amtrak customer attempting to determine the likelihood that an Amtrak train will arrive at its destination on schedule, the methodology is not appropriate for determining whether CSX is providing good service to Amtrak. Pursuant to Amtrak's contract with CSX, Amtrak trains that are delayed due to factors beyond the control of CSX are not counted as late for purposes of calculating on-time performance. These factors include, among other things, delays due to: (1) Amtrak equipment failure; (2) Amtrak trains being operated at a power-to-weight ratio less than the ratio used to establish the scheduled running times; (3) switching Amtrak Express (freight) cars; (4) severe weather conditions; and (5) grade crossing accidents.

The actual on-time performance levels are substantially higher than Amtrak portrays them to be. During the past five years, Amtrak trains have had an 86% on-time performance rate over CSX's lines, a rate comparable to Amtrak's on-time performance rate over Conrail's lines for the same period. Despite CSX's efforts to improve its performance rate

densities of passenger and freight traffic over the lines; and physical and operational complexities among various routes. That is, performance comparisons should only be made where like things are being measured -- in terms of both criteria and conditions.

in 1997, its on-time performance of 85% for fiscal year 1997 (October 1996-September 1997) did not improve over its five-year average because of delays during the summer on the busy Alexandria, VA to Richmond, VA line segment resulting from repair work required after a derailment in Rosslyn, VA and major maintenance work and the upgrade of signalling unrelated to the derailment (which will in the long term improve on-time performance on this line). Since September 1997, however, Amtrak trains operating over CSX lines have had very good on-time performance rates: 90% in September, 84% in October, and 90% in November. On many days since the beginning of September, CSX has attained 100% on-time performance of Amtrak trains.

Amtrak suggests that certain traffic increases contemplated in CSX's Operating Plan may cause interference with Amtrak trains over certain line segments. NRPC-7, Larson VS at 17-19. However, based on my operational experience, I do not believe that there is any meaningful risk of interference with Amtrak trains from the projected traffic increases.

Amtrak specifically identifies four line segments of concern: Alexandria to Richmond, Richmond to Rocky Mount, Pensacola to New Orleans, and Buffalo to Schenectady. Capacity on the Alexandria to Richmond line segment is addressed below in connection with my discussion of VRE's Comments and Request for Conditions. The Richmond-Rocky Mount line segment has more than sufficient capacity to handle the projected 5-6 train increase in freight traffic. The line is double track in certain segments and in others single track with sidings. It is equipped with a modern CTC signal system and is FRA Class 4 which permits passenger train speeds of up to 79 mph. One bottleneck on the line does exist at the Appomattox River Bridge, which is a single main track bridge with

a slow order of 10 mph. CSX is presently planning a project to rehabilitate this bridge and increase speed over it, which would improve performance over this line. Even without the benefit of this improvement, however, Amtrak on-time performance over this segment in the most recent month, November 1997, was 89%.

With regard to Amtrak's Sunset Limited on the Pensacola to New Orleans line segment, the westbound Sunset Limited has had a reasonable performance record over this line segment. It is the eastbound Sunset Limited that has had trouble. The eastbound Sunset Limited, which originates in Los Angeles, arrived at CSX in New Orleans, on average, 8.7 hours late in September 1997, 4.9 hours late in October 1997, and 4.3 hours late in November 1997. It is thus impossible for CSX to maintain a scheduled slot for the eastbound Sunset Limited. This line segment is single track and has stretches of "dark territory." Once a westbound train is cleared to proceed, an eastbound train must wait for it to clear the segment. If the Sunset Limited shows up after a westbound train (including the westbound Sunset Limited) is cleared, it must wait its turn, even though it has dispatching priority over the next freight train to show up. A significant number of the meets which have delayed the eastbound Sunset Limited have been with the westbound Sunset Limited. When Amtrak's on-time performance rate is adjusted for these non-CSX-caused delays, the total adjusted on-time performance for the Sunset Limited is 86% for September 1997, 97% for October 1997, and 89% for November 1997. Freight traffic is predicted to increase on this line segment by only 1-2 trains per day, an insignificant increase. Amtrak's complaint about the Sunset Limited, apart from being misleading, has nothing to do with the Transaction.

Amtrak does not complain about poor on-time performance on the Schenectady to Buffalo line segment (Amtrak's Empire Corridor service), but simply notes that traffic will increase on this line. CSX plans to upgrade this line where possible to 79 mph maximum for passenger trains which should benefit the on-time performance on this line.

In summary, CSX under my direction has and will continue to cooperate closely with Amtrak to enhance intercity passenger train timeliness.

3. Higher Speed Passenger Service on the Empire Corridor

I have had several meetings with New York state and county officials about their desire to improve average speeds and reliability of passenger service on the Empire Corridor. As noted above, CSX plans to upgrade this line to 79 mph for passenger trains. CSX is willing to discuss in good faith Amtrak's proposal to increase the speed of passenger service on the Empire Corridor above 79 mph if the project would not interfere with CSX's freight operations and if the project were truly at "public expense." There are many costs associated with increasing the speed of passenger trains on tracks also used for freight trains, such as installation of cab signalling systems on all locomotives operating over the line, that should fairly be treated as part of the "public expense" on the project. My efforts while Amtrak's President led to the Turbo Train Service on the Empire Corridor, followed by higher operating speeds. I will continue to assist in further improvement planning to the extent public funding becomes available. In this regard, we have agreed with the New York Department of Transportation ("NYDOT") to cooperate in a number of tests of new technology for signals, grade crossing protection, and higher train speeds.

B. Chicago Metra

Metra's Southwest

Service trains operate through the Forest Hill interlocker which has been controlled by the B&OCT, a wholly owned subsidiary of CSX, since 1914. Metra's trains also operate through the Belt Junction interlocker (located directly to the east of Forest Hill), which is controlled by the Belt Railway Company of Chicago. Metra's operations are run by very experienced and capable personnel, which results in highly reliable service. Although Metra trains by any reasonable measure enjoy a good record of timely passage through both Forest Hill and Belt Junction, Metra has not been hesitant in bringing complaints about episodic delays to its trains to CSX's attention.

Metra greatly exaggerates the delay to its passengers at the Forest Hill interlocker. Vaughn L. Stoner, Metra's Chief Operations Officer, states that "[i]n the past twelve months, Metra passengers have incurred 9240 man hours of delay at the Forest Hill Interlocker." METR-7, Stoner VS at 3. A review of Metra's own records of delays at the Forest Hill interlocker, however, reveals that almost half of this delay (4,482 man-hours in a year) was caused by factors other than CSXT freight train interference or other factors outside CSX's control. Although the remaining 4,758 man-hours of delay in a year still sounds like a huge number, it is only 11 seconds per trip for each of Metra's 1,501,876 passengers² who passed through the interlocking during the year. Moreover, 2,763 of these man-hours of delay were related to a single incident on January 10, 1997 involving a switch failure and freight train interference. While I must acknowledge that that was a bad day for

² Metra provided this number for 1996. Interrogatory Response, METR-9 at 4.

Metra commuters, the delay experienced at the Forest Hill interlocker during the rest of the year averaged less than five seconds per trip. Looked at in another way, of the approximately 385 Metra trains that operated through the Forest Hill interlocker each month during the past year, an average of only 2.4 (0.6%) trains per month were delayed due to CSX freight train interference or other CSX-avoidable causes. It is difficult for me to believe Metra's claim that it is not getting dispatching priority through the interlocker when 99.4% of its trains pass through the interlocker without delay.

Nevertheless, CSX recognized that improvements could be made, and on November 28, 1997, completed a project to automate the interlocking. As part of this project, the interlocker operator has been relocated from the tower at the interlocker to an office shared by the B&OCT and BRC dispatchers, which will facilitate coordination and thus traffic flow through the interlocker. In addition, CSX has agreed to allow Metra to install snowblowers and/or melters on the switches, which will reduce mechanical problems during the winter months. Aside from enhancing safety, these improvements should more than offset any potential for delay from increased traffic through the interlocker as a result of the Transaction.

Metra trains are often delayed at Forest Hill when they meet other Metra trains at the end of the double track and because of signal problems on Metra's own line. The solution to a further reduction in Metra delays at Forest Hill thus lies in Metra's scheduling or the addition of double track, not in a change of control of the interlocker.

Nevertheless, CSX is willing to cooperate in good faith with Metra to ensure that we continue to subject Metra's passengers to the absolute minimum of delay. To this end, we

have discussed with Metra the establishment of a Joint Review Committee consisting of representatives from Metra, the Belt Railway of Chicago, and CSX which would meet regularly to review operations through the Forest Hill and Belt Junction interlockers.

C. New Jersey Department of Transportation and
New Jersey Transit Corporation ("NJT")

The New Jersey Department of Transportation ("NJDOT") and the New Jersey Transit Corporation ("NJTC") (collectively referred to herein as "NJT") ask for four conditions which they say are needed to protect passenger transportation in New Jersey. CSX had not had any relationship with NJT prior to this Transaction. Like Metra, the operations of this commuter railroad are run by very experienced and capable personnel. Discussions regarding operations issues were productive from the outset. It was helpful to be able to assure NJT that there were not going to be significant traffic changes on the lines they share with Conrail and that CSX and NS would follow Conrail's operating practices for some time after approval.³ Because the Shared Assets Areas were somewhat of a new concept, we discussed how they would work.

In discussions with NJT before it filed its Comments and Request for Conditions, I had informed NJT that CSX was willing to agree to NJT's terms with respect to three of the requested conditions, and CSX will stand behind those offers. The only unresolved issue between CSX and NJT involves NJT's South Jersey Light Rail Transit Project.

³ NJT originally asked for a condition requiring capital improvements on the NK to Aldene line segment, but since this line segment will experience a decrease in traffic, the request was dropped.

1. Coordination with NJT in North Jersey and Philadelphia/South Jersey Shared Assets Areas

NJT suggests that senior officials of CSX, NS and the Conrail Shared Assets Operator ("CSAO") should meet regularly with the Commissioner of Transportation of NJDOT or his designee to discuss the policy issues important to ensuring smooth operations of both freight and passenger services within the New Jersey Shared Assets Area. CSX does not disagree. Indeed, CSX and NS made the following offer to NJT prior to October 21, 1997 and are here willing to stipulate to the following procedure for coordination:

The parties agree to meet regularly, in accordance with a schedule to be established by the parties, to discuss major issues necessary to ensure the smooth operation of both the passenger and freight service within the New Jersey Shared Assets Areas. Present at these meetings will be the Commissioner of Transportation (or designee(s)), the senior CSAO official (or designee) in charge of the New Jersey Shared Assets Areas, and the senior official of each of CSXT and NSR (or designees) having responsibility for freight rail operations in New Jersey, including such operations in the New Jersey Shared Assets Areas. In the event that New Jersey representatives disagree with a solution to an issue of concern to NJDOT/NJT, arrived at by NSR, CSXT, and CSAO, the Commissioner of Transportation may confer with the President or Chief Executive Officer of CSXT and/or NSR to resolve such issues.

In addition, the parties agree that close communications and cooperation at the operating level shall be maintained between NSR, CSXT, CSAO and NJT.

2. ATC/PTS

NJT seeks a condition requiring CSX, NS and the CSAO to install a new technology -- Automatic Train Control/Positive Train Stop ("ATC/PTS") -- on their locomotives operating on or over NJT-owned properties. NJT-8 at 10-12. NJT represents that this on-board apparatus will be "responsive to the roadway equipment installed on all or

any part of Amtrak's Northeast Corridor as required by the Federal Railroad Administration ("FRA") regulations." NJT-8 at 12. As I told NJT prior to October 21, 1997, CSX is willing to install the requested on-board apparatus on locomotives operating over NJT-owned lines, even though CSX has no plans at present to adopt it throughout its system.

3. NORAC Operating Rules

NJT seeks a condition requiring Applicants to adopt Northeast Operating Rules Advisory Committee ("NORAC") Operating Rules presently in effect on all Conrail lines within the NJCAA for a period of three years after approval of the transaction. NJT-8 at 12-13. As I told NJT prior to October 21, 1997, CSX and NS have determined that NORAC Operating Rules will be retained in the NJCAA for the three-year period covered by the Operating Plans. I also understand that CSX's Safety Integration Plan discusses the Operating Rules question.

4. South Jersey Light Rail Transit Project

I am very familiar with the issues presented by light rail operating over conventional rail tracks, as I was project manager for the first feasibility study of the Baltimore Light Rail Project in the 1980's. Based on that experience, it is my view that this operating scenario only works if there is almost no freight activity on the line. Conventional rail equipment (be it freight or passenger) and light rail equipment are not compatible. The structural design of light rail equipment is fundamentally different than the structural design of conventional rail equipment. Light rail equipment has a much lower static end strength and rollover strength than does conventional rail equipment. If a light rail trolley and a freight train or commuter rail train were to collide, the light rail trolley would most likely be crushed. Recognizing the

potential for a catastrophe, railroad industry practice does not permit the concurrent operation of light rail equipment and conventional rail equipment on the same line.⁴

Because the schedules of light rail trips and freight trains cannot be interwoven through the day, NJT has proposed to "window" freight traffic within the late night hours. I understand that the specific operational problems presented by the proposed project on the Bordentown Secondary are addressed by John Orrison in his Rebuttal Verified Statement. But it is apparent to anyone who has worked in the rail industry as long as I have that a proposal which does not allow for increased customer demands and future industrial growth, equipment malfunctions, and severe weather cannot be called a workable proposal. CSX is willing to work with NJT in evaluating options for passenger service in South Jersey. This is a matter that we should be able to address through commercial negotiations as the process moves forward. It appears, however, that the option most likely to be feasible would be constructing a separate track for a light rail system on Conrail's right-of-way, and it appears that NJT has not yet studied this option.

NJT's proposed light rail project has been controversial in New Jersey, both at the local and state levels. Many citizens and politicians are questioning whether the hefty price of the project is justified by its benefits. NJT's 1996 study assessing the feasibility of the light rail and conventional commuter rail options (included in Vol. 3) estimated the cost of

⁴ Many in the rail industry believe that current FRA safety regulations implicitly prohibit such concurrent operations. I am of this school. If there is any doubt as to the current state of the law, it will soon disappear: the FRA recently announced, in a notice of proposed rulemaking, that its new passenger equipment safety standards will explicitly prohibit the concurrent operation of light rail equipment and conventional rail equipment on the same line.

the diesel-powered light rail operation at \$314 million, but some newspaper articles have quoted the price at \$450 million. I have attached a few sample newspaper articles discussing opposition to the project. Reistrup Exhibit 1.

D. Southeastern Pennsylvania Transportation Authority
("SEPTA")

In its Comments and Request for Conditions, SEPTA seeks to modify its Trackage Rights Agreement with Conrail, dated October 1, 1990, in three material respects and to impose the redrafted "contract" on CSX and NS, as successors to Conrail. Specifically, SEPTA requests: (1) that the Board void Section 8.01(b), providing that either party may terminate the agreement upon six months written notice, and replace it with a new Section 8.01(b) providing for a ten-year term; (2) that the Board void the provision of Section 3.02(b) giving Conrail the right to assume dispatching control of its own Trenton Line on sixty days written notice to SEPTA; and (3) that the Board grant SEPTA operating rights for new light rail service over the Conrail Harrisburg Line to Reading and the Morrisville Line between Dale and Morrisville.

CSX had not had any relationship with SEPTA prior to this Transaction. Like Metra and NJT, the operations of this commuter railroad are run by talented personnel. Discussions regarding operational issues were productive from the outset. It was helpful to be able to assure SEPTA that there were not going to be significant traffic changes on the lines they share with Conrail and that CSX and NS would follow Conrail's operating practices for some time after approval. As with NJT, because the Shared Assets Areas were somewhat of a new concept, we discussed how they would work.

It soon became apparent to me that CSX would be able to take over Conrail's operations and succeed to Conrail's good working relationship with SEPTA. Half of the Conrail/SEPTA operation is Conrail operating over SEPTA lines, and thus our relationship with SEPTA is built solidly on mutual need and common interest. To think that the contract would be cancelled or SEPTA would not receive fair treatment is ludicrous. The issues that prevented complete agreement with SEPTA do not arise out of legitimate operational concerns related to the Transaction, but are in my view an effort to use the Board's process as leverage to obtain concessions that SEPTA knows it cannot obtain through the normal process of arm's-length negotiation.

Although CSX opposes the imposition of the requested conditions, CSX is committed to establishing a long-term, mutually beneficial relationship with SEPTA.

1. The Term of the Agreement

Although Conrail and SEPTA each have the legal right under Section 8.02(b) to terminate the Trackage Rights Agreement upon six months notice, as a practical matter neither is likely to invoke the right as each needs some lines of the other to operate. SEPTA's suggestion that CSX might be more likely than Conrail to terminate the Agreement is not supported by the realities of the Transaction. I have informed SEPTA that CSX is not opposed in principle to replacing the termination provision with a fixed-term extension of the Agreement, but the sticking point to date has been extension of the Agreement's provisions governing liability apportionment. SEPTA's very low cap on its liability leaves Conrail (and

CSX) unfairly exposed when an incident occurs involving SEPTA service over Conrail lines.

2. Control of Dispatching on the Conrail Trenton Line

Section 3.02(a) of the Trackage Rights Agreement provides that Conrail has the right to control dispatching on all Conrail-owned lines. Section 3.02(b), however, grants SEPTA the right to control dispatching on two segments of Conrail's Trenton Line, subject to Conrail's right to reclaim dispatching control upon sixty-days written notice:

SEPTA shall exercise dispatching control of all trains on the Trenton Line (the former New York Short Line) from C.P. Newtown Junction (M.P. 6.2) to Neshaminy (M.P. 21.1), and on the Trenton Line (the former New York Branch) from Neshaminy (M.P. 21.1) to Trent (M.P. 33.0), except that Conrail, on sixty (60) days written notice, may assume such dispatching control.

SEPTA requests that the Board, as a condition to the approval of the transaction, void Conrail's right to assume dispatching control on sixty days written notice, thus giving SEPTA a permanent right to control dispatching on the Trenton Line. SEPTA has not provided any justification for this condition.

Use of the Trenton Line will be allocated to CSX. The CSX Operating Plan does not project any increase in freight traffic on the Trenton Line segments over which SEPTA operates. Consistent with CSX's overall policy not to change Conrail's operating practice and rules on Day One, CSX does not have any plans at present to exercise its right under Section 3.02(b) to assume dispatching control. Even if CSX were to exercise this right sometime in the future, SEPTA's interests would remain fully protected. Section 3.02(a) of the Trackage Rights Agreement provides that Conrail may not exercise its dispatching rights "in a manner which would unreasonably interfere with SEPTA's Trackage Rights."

Moreover, Section 3.02(d) provides that "[t]he scheduling and movement of SEPTA passenger trains shall take preference over all freight train movements."

3. Proposed Light Rail Service

Use of the Conrail lines over which SEPTA proposes to commence new light rail service will be allocated to NS, although CSX will have trackage rights over the Morrisville line. SEPTA has not presented any concrete proposals for this new service, but in accordance with what I said in connection with NJT's proposal, it does not appear that a light rail service would be feasible unless sufficient right of way is available for SEPTA to build a separate track for it.

E. Northern Virginia Transportation Commission and Potomac and Rappahannock Transportation Commission ("VRE")

VRE commenced providing commuter rail service in northern Virginia and the District of Columbia in the summer of 1992 over lines of CSX, NS and Conrail. In its Comments and Request for Conditions (VRE-8 and VRE-9), VRE seeks "acquisition of operating rights" over certain lines owned by CSX, NS, and Conrail. VRE-8 at 31-32. VRE's request for "acquisition of operating rights" is perplexing, however, because it already has "operating rights" pursuant to its Operating/Access Agreements with CSX, NS, and Conrail.⁵ Instead, it appears that VRE seeks to modify its operating rights, as defined in

⁵ Operating/Access Agreement Between CSX Transportation, Inc. and Northern Virginia Transportation Commission and Potomac and Rappahannock Transportation Commission Concerning Commuter Rail Service, dated January 10, 1995, effective through June 30, 1999; Operating Access Agreement Between Norfolk Southern Railway Company and Northern Virginia Transportation Commission and Potomac and Rappahannock Transportation Commission, dated July 12, 1996, effective through July 15, 1998; Operating Access Agreement Between Consolidated Rail Corporation and Northern Virginia Transportation Commission and Potomac and Rappahannock Transportation Commission

its Operating/Access Agreements with CSX and NS, in numerous material respects and to impose the redrafted "contracts" on CSX and NS. VRE also asks the Board to terminate the currently effective Operating Access Agreement between VRE and Conrail with respect to the line segment between RO Interlocking in Arlington, Virginia and the Virginia Avenue Interlocking in Washington, D.C. and to apply the terms of the redrafted "contract" with CSX to that line segment. These requests have nothing to do with the Transaction. VRE is trying to exploit the fortuity of this Transaction to get a better deal than it was able to negotiate with CSX in 1995.

1. VRE's Factual Presentation is
Misleading or Erroneous in Many Respects

CSX has always attempted to provide quality service to VRE. In the past VRE has appreciated this effort, and has been willing to state its appreciation in writing. See Reistrup Exhibit 2. I have carefully analyzed VRE's factual representations in its submission to the Board and have concluded that they are erroneous or misleading in many respects.

First, VRE erroneously assumes that capacity on the line is constrained by freight traffic, when in fact it is constrained by passenger traffic. An additional freight train does not "consume" the same amount of capacity as an additional passenger train. The RF&P line from Fredericksburg to Alexandria is double track (except for the bridge at Quantico) with CTC bi-directional signalling. There would be no question that this line would have more than adequate capacity if all the trains expected to operate over the line post-Transaction were freight trains. This is because freight trains operate throughout the day and night.

Concerning Commuter Rail Service, dated December 1, 1989, renewed December 1, 1997, effective through December 1, 1998.

Capacity constraints exist because 30 of the 46 trains presently operating over the line segment are passenger trains, most of which operate within the morning and evening rush hours.⁶ Interference from other passenger trains is a bigger problem to VRE than interference from freight trains. This can be seen on the string line charts attached to John Orrison's Rebuttal Verified Statement.⁷ The Amtrak and VRE trains are concentrated in the morning and evening rush hours, whereas the freight trains largely operate outside of those periods. VRE delays are more pronounced during the evening rush hour when there is heavier Amtrak traffic than during the morning rush hour when Amtrak traffic is lighter. Amtrak trains have dispatching priority over both VRE and CSX trains under federal law, 49 U.S.C. § 24308(c). Another significant problem is that Amtrak's Auto Train blocks one of the two main lines at Lorton, Virginia for about 20-30 minutes each afternoon, although the delay can last for up to an hour when Amtrak has difficulty coupling segments of the train.

The analysis of Charles H. Banks presented by VRE also shows this to be the case. VRE-8, Banks VS. I have not been able to discern all the assumptions that went into Mr. Banks' study. But just taking his own numbers at face value, Mr. Banks reports in Tables 5 and 6 (Banks VS at 15A, 15B) that, during a 16-month period, 75 Fredericksburg-line VRE trains were delayed by interference from freight trains and 61 Fredericksburg-line VRE trains were delayed by interference from other passenger trains, and that 51 Manassas-line VRE

⁶ There are presently 30 passenger trains on the Fredericksburg to Arlington line segment (12 VRE trains and 18 Amtrak trains) and 16 CSX trains. CSX is proposing to increase its freight service over the line by 7 trains.

⁷ The string line charts presented by Charles H. Banks (VRE-8, Banks VS at 4A, 4B) show trains going in both directions on the same chart, yet do not make it clear that the line is double track.

trains were delayed by interference from freight trains and 88 Manassas-line VRE trains were delayed by interference from other passenger trains, for a total of 126 VRE trains delayed by interference from freight trains and 149 VRE trains delayed by interference from other passenger trains.

Second, VRE's on-time performance statistics overstate the delays to its commuter trains caused by CSX. While I certainly understand VRE's displeasure at the significant delays caused by the derailment in Rosslyn in July 1997, that unfortunate incident should not be allowed to distort the overall record. A significant part of the fees VRE pays to CSX is directly tied to performance guarantees. The Agreement sets forth how on-time performance is calculated. It does not include delays not attributable to CSX, including delays attributable to Amtrak intercity operations, delays attributable to VRE's operator (Amtrak Commuter),⁸ trains delivered late to CSX, and mechanical failure of VRE's equipment.⁹ Using the contract measure, VRE has enjoyed very good on-time performance on CSX. Contract performance for 1996 was 94%. Contract performance for 1997 until the derailment in July was 95%. Performance since the track was restored on August 20 has been running at 97%. CSX could have declared the derailment a force majeure disruption and terminated all VRE service, but CSX complied with VRE's request to continue service as best it could. In addition, at VRE's request, the interlocking where the accident occurred was not just

⁸ Amtrak Commuter operates VRE under contract with the Northern Virginia Transportation Commission and the Potomac and Rappahannock Transportation Commission.

⁹ VRE also appears to be counting as "delayed" trains that miss their arrival time as published in VRE's public schedules, but are on time according to the running times agreed to in the Operating/Access Agreement.

repaired, but upgraded with high-speed turnouts, which upgrading extended the time to recover from the accident. Moreover, CSX suggested that maintenance work underway near Fredericksburg be suspended after the accident so as not to compound the delay to VRE trains, but VRE declined the suggestion.

Third, I do not agree with VRE's prediction that its on-time performance will drop to 81.1% after the Transaction. VRE's analysis which resulted in the conclusion of an 81% on-time performance figure is not sound. Based on my operational experience, the increased freight traffic will have no effect on VRE.

One should start with a more reasonable assessment of current on-time performance -- 95% or higher, as shown above. One should then look at the schedules of the CSX trains proposed in the Operating Plan, taking into account the fact that the line is double tracked. As explained in the Rebuttal Verified Statement of John Orrison, this analysis shows that there will not be interference. One should also take into account the effect of the recent improvements to the line, some funded by CSX and some funded by VRE, and the additional improvements planned for the line.

CSX has completed several capital improvement projects on portions of the Fredericksburg line and is continuing to improve the remaining portions. These projects, funded entirely by CSX, include: 1) replacing rail and ties, 2) improving the ballast shoulder, 3) upgrading signal relays to modern microprocessors; and 4) installing CTC modern dispatch bi-directional signalling. In addition, CSX has rebuilt the trackage through the old Potomac Yard in Alexandria, including a third track over portions of the segment; the funding for this project was shared by CSX, VRE and others.

One important improvement CSX has planned and will fund is the clearance and track upgrade of the Virginia Avenue Tunnel in the District of Columbia. The tunnel project will permit track speed to increase from the present 10 mph to 25 mph or more, allowing freight trains to travel much more quickly over the line segments used by VRE. The increase in freight speeds will effectively increase the capacity of the line and alleviate a potential source of delays to VRE trains. The proposed improvement of the Virginia Avenue Tunnel is recognized by Amtrak and the FRA as having "a positive effect on passenger train performance south of Washington." The Northeast Corridor Transportation Plan, Report to Congress September 1997, Washington-Richmond Supplement Draft Report at V-7 (included in Volume 3). CSX will make every effort to plan its reconstruction of the Virginia Avenue Tunnel so that it will not interfere with freight and passenger service. If it turns out that some delays are unavoidable, CSX will work with VRE to minimize the delays.

Other projects are also planned. CSX plans to construct a siding at Lorton which will allow Amtrak's Auto Train to be connected without blocking a main track. This project, which is in the engineering phase, will be publicly funded. Further modernization of interlockings is planned to be accomplished with mixed CSX/public funding. VRE is also commencing design of the expansion of the bridge at Quantico to accommodate a second track.¹⁰

¹⁰ In addition, the Transaction will likely benefit VRE in two other respects. First, the CSX Operating Plan presented in the Application will assist CSX to meet its goal of operating a scheduled railroad. By adhering to schedules, train operations, both freight and passenger, will be improved. Second, dispatching of the line segment from RO interlocking in Arlington, VA to the Virginia Avenue interlocking in Washington, D.C. is now controlled by Conrail. After the Transaction, dispatching control would be transferred to CSX. VRE's Fredericksburg-line trains would thus be under the control of one dispatcher for the entire trip and Manassas-line

Fourth, with all due respect to VRE, I believe that its complaints about CSX management of the line are based largely on misunderstandings about rail operations. VRE is a very different organization from Amtrak, Metra, NJT, and SEPTA. VRE was only created in the late 1980s and did not begin commuter service until 1992. It does not own any of its own rail lines. The commuter service provided by VRE is operated by Amtrak Commuter under contract with VRE. Its ridership is small -- only about 7,200 boardings/day -- compared to that of the other commuter agencies. VRE is managed by persons who have business experience primarily, rather than railroading experience. None of this is said to be critical. These are just the facts. To the extent that VRE complains that CSX has not in the past had a representative close by who communicates regularly with it and can respond quickly to problems as they arise, I pledge that I stand ready, willing and able to fill that role, together with my staff.

Fifth, VRE claims that "[d]uring the maintenance season, CSX gives little or no regard to the operating schedule of VRE," and then states the numbers of trains delayed during the extraordinary period of the Rosslyn derailment. VRE-8 at 26. This claim is false and demonstrates VRE's lack of appreciation for CSX's efforts to accommodate it. Maintenance work on this line is regularly done at night to accommodate VRE and Amtrak operations, even though the Operating/Access Agreement permits maintenance work to be performed during the day, and indeed expressly states (Section 2.10) that maintenance work "will occasionally result in delays or cancellations of operations of the commuter rail passenger service." On all other CSX lines, CSX performs maintenance work during the

trains would be under the control of two rather than three dispatchers.

daytime and curfews all traffic. The schedule for major maintenance work on the line has been set for 1998 and CSX will continue to perform this maintenance at night.

Sixth, I must take issue with VRE's charge that CSX is responsible for its ridership declines. Ridership declined significantly from mid-1996 to mid-1997 before the Rosslyn derailment on July 8 -- from an average of 7,656 boardings a day in Fiscal Year 1996 (VRE's fiscal year is from July through June (VRE-8 at 21)) to an average of 7,154 boardings a day in Fiscal Year 1997. VRE-8, Isaac/Taube VS, Att. 4. This decline occurred when on-time performance was very good by any reasonable standard -- an average of 90.1% (VRE-8, Roberts VS, Att. 2), including delays not caused by CSX. VRE admitted in its response to Applicants' interrogatory that the opening of the new HOV lanes on I-95 and decline in employment in Crystal City, Virginia contributed to the decline in ridership during this period. VRE-10 at 5. Other factors that have been cited as reasons for the drop-off are VRE's high fares and high parking costs. This spring, Stephen Roberts, VRE's Director of Operations, explained the ridership decline as follows: "The reason our numbers are less than they were a year ago is because people are making good decisions. It's cheaper to drive than take VRE. But that won't last forever." "Virginia Railway, a Service That's Losing Steam; Fare Cut Considered as Ridership Plunges," Washington Post (April 27, 1997). Reistrup Exhibit 3.

2. The Real Issue is Who Will Fund Improvements

The crux of the dispute is funding for infrastructure improvements required to support passenger operations. CSX acquired the RF&P line in 1991 and has been working to improve it. As improvements have been made, delays have decreased. VRE is attempting to

shift funding for additional line improvements needed for its passenger service to CSX. Numerous improvements to increase the capacity of the line for passenger service are contemplated in the contract between CSX and VRE. The only difficulty for VRE is that VRE's contract requires VRE to fund them, whereas VRE, not surprisingly, would like the Board to make CSX fund them. The funding of VRE has been a matter of some controversy within the State of Virginia since VRE was first proposed. Although VRE has many supporters, notably its riders, many others question whether the government subsidy to VRE is the best use of the money. See, e.g., Reistrup Exhibit 3.

CSX has worked and will continue to work with VRE management to provide a quality commuter service for northern Virginia. VRE has had access to CSX senior management, and has been involved in planning improvements that CSX has undertaken. CSX has offered VRE a ten-year extension to the Operating/Access Agreement to enable VRE to obtain long-term funding from bonding sources. CSX has also pledged to continue discussions on contractual amendments VRE desires, most notably a program of incremental infrastructure improvements and service expansions. However, these are matters that we should be free to negotiate with VRE. This Transaction does not change that fact or otherwise justify any of the substantial contract amendments VRE has proposed.

III. CONCLUSION

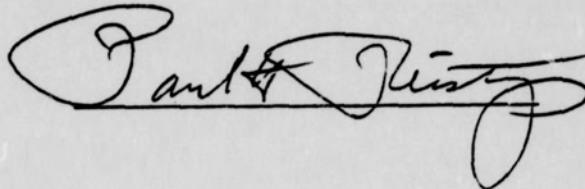
CSX has a long history of working together with passenger agencies to ensure that all trains on its lines operate in the safest and most efficient manner possible. CSX will continue to abide by this philosophy as it expands its rail network. I am confident that the

Transaction, if approved by the Board, will yield benefits for freight and passenger operations alike, and i will continue to work hard to make these predictions a reality.

VERIFICATION

I, Paul H. Reistrup, declare under penalty of perjury that the foregoing is true and correct.

Further, I certify that I am qualified and authorized to file this verified statement. Executed
on December 10, 1997.

A handwritten signature in cursive script, appearing to read "Paul H. Reistrup", written in dark ink.

REISTRUP EXHIBIT 1

■ "Right off the bat, we want to work on an alternate plan for light rail. We'll pursue a bill to make that happen."
Dr. Herb Conaway, 7th District assemblyman-elect

Dems take aim at light rail

Conaway, Conners declare election victory, vow to fight NJ Transit plan

By Kathleen Cannon
BCT staff writer

MOUNT HOLLY — Introducing the new 7th District assemblymen-elect, Dr. Herb Conaway and Jack Conners.

Yes, exactly one month after the election, the topsy-turvy race is finally settled, with the Democrats declaring victory over Republicans Ken Faulkner and George Williams following a recount.

Yesterday's mop-up of the weeks-old recount involved checking absentee and provisional ballots. It changed the results by only one vote, not enough to affect the outcome.

The final tallies are Conaway, of Burlington City, 27,457 votes; Conners, of Pennsauken, 27,409; Faulkner, of Delanco, 27,335; and Williams, of Maple Shade, 25,211.

These new results supplant those announced on Election night. Then, it appeared Faulkner placed first, Conaway, second and Conners third, more than 200 votes behind Faulkner, in the race for two seats.

The subsequent recount produced enough new votes, mostly from Pennsauken, to catapult both Democrats over Faulkner.

"I want to thank the voters of the 7th District, all of them, not just the 74 that put me over," Conners said at a news conference yesterday.

But not so fast.

County Republican Chairman Glenn Paulsen said last night that he may appeal the Democrats' victory. Faulkner has at least until the



BCT photo/DENNIS McDONALD

See RECOUNT A9

Seventh District Assemblymen-elect Jack Conners (right) and Dr. Herb Conaway listen to a question during a news conference yesterday.

Assemblymen-elect intend to fight light-rail plan

RECOUNT From A1

end of the week to file for a contested election, he said.

"We haven't lost yet," he said, adding Faulkner has instructed him to explore all options.

Faulkner could not be reached for comment last night.

In case a possible GOP appeal fails, Paulsen declined to say whether Faulkner would have an early advantage among Republican contenders to challenge the Democrats in the 1999 election.

Conaway dismissed talk of

another appeal.

"It's hard to imagine where they might be able to find the votes to take Ken from third to second place. I'm not terribly concerned about it.

"You're seeing the start of two new assemblymen in Trenton. We're looking forward, not back," Conaway said.

And look forward they did.

The Democrats said one of the first things they will do after their swearing-in on Jan. 13 is introduce a resolution opposing NJ Transit's \$450 million plan to build a light rail system along the Burlington

County riverfront. Both men oppose the light rail plan as disruptive and expensive.

"Right off the bat, we want to work on an alternate plan for light rail. We'll pursue a bill to make that happen," Conaway said.

He said the measure, which would express the opinion of the Legislature, may propose beefing up bus transportation in the county.

"We're not going to turn our backs" on light rail opponents, Conners said.

The Democrats acknowledged that they will need Republican sup-

port in the GOP-majority Legislature for this initiative. They also conceded that Republican Sen.-elect Diane Allen, R-7th, of Edgewater Park, a light rail proponent, will be a roadblock.

"I guess we're going to have part ways on that" with Allen, shrugged Conners, who attributed his and Conaway's victory in part to their light rail position.

Allen was out of state last night and unavailable for comment.

Paulsen laughed when told of the Democrats' comments.

"To me, the whole light rail thing

was a red herring in the election," he said. "I don't think public policy should be on the basis of, if Diane is for something, we'll be against it. I hope that's not their motivation."

Conaway said another high priority is a bill reforming the Pharmaceutical Assistance for the Aged and Disabled program to aid a blind Maple Shade man who has multiple sclerosis. The man's family earned just \$70 more than it should to be eligible for the discounted prescription drug program and now owes the state \$10,000 in back costs.

Conaway, a lawyer who is a practicing medical doctor, said he will ask for an assignment to the Assembly Health Committee. Conners, a banker, said he hopes to be appointed to the banking committee.

The Democrats' first job, though, is to find a district office and hire a staff. They will be replacing Allen and Assemblyman Carmine DeSopo, R-7th, of Westampton, as the district's representatives and need their own office to serve constituents.

Both Conaway and Conners, who called Faulkner and Williams "a couple of good guys," said they were relieved that the drawn-out contest was finally over.

"It was a close one and it took a long time coming, but it's sweet here at the end," Conaway said.

"I have learned the importance of every vote. I will never, ever take another vote for granted," Conners said.

Citation
12/4/96 BSX-BRLGCT A1
12/4/96 Burlington County Times (N.J.) A1
1996 WL 8819712

Found Document

Rank(R) 1 of 1

Page

Database
BSX-BRLG

Burlington County Times
Copyright Burlington Times Inc. 1996

Wednesday, December 4, 1996

Palmyra meeting draws rail opponents
By Jeff Beach

Palmyra, NJ, US, Middle Atlantic --

PALMYRA -- Public hearings on the proposed light rail system through the county's riverfront towns got off to a bumpy start last night as residents here peppered New Jersey Transit officials with questions and objections to the line.

NJT officials tried to convince about 60 residents, many of whom live within 50 feet of the existing track bed, that the proposed \$313.9 million passenger rail line between Trenton and Camden is a good idea.

At times, though, NJT representatives seemed to be their own worst enemies, giving incomplete answers to pointed questions and providing information that conflicted with previous statements.

"Your problem is you have incomplete information, conflicting information, at least as it comes through the media," said borough resident Jack Monahan.

The gathering at the Palmyra Borough Hall on Broad Street was the first of five public hearings to be held over the next two weeks on the controversial rail proposal. The next meeting is scheduled for 7:30 tonight in the Delran Township building on Chester Avenue.

Last night, the scales were decidedly tipped in opposition to the rail line. Many in the audience commented that NJT's public relations style raised almost as many questions as it answered.

"You keep saying things like 'probably' or 'we don't have that worked out yet,'" said Garfield Avenue resident Tom Delmore. "Words like that bother me."

While NJT was roundly criticized for the way it has handled public input, the bulk of the concerns raised by residents centered on safety. In a town practically bisected by the rail line, residents said, passenger rail service could create any number of hazards as children cross the tracks to reach their schools.

Many who spoke said they didn't think NJT's plans to provide

Copr. (C) West 1997 No Claim to Orig. U.S. Govt. Works

12/4/96 BSX-BRLGCT A1

educational videos about train safety to schools or placing buffers around the tracks to keep kids away would prevent accidents from occurring.

"Nobody can stand here and tell you you're never going to have an accident," acknowledged Frank Russo, NJT's senior director of new rail construction. "What we can hang our hat on is that this system is infinitely safer than any trips you'll take in your automobile and it's safer to the pedestrian than crossing a street."

Some residents questioned why NJT's initial plans show Palmyra slated for two stations, one a park-and-ride on the south side of Route 73 and the other a walk-on station in the center of town.

Russo said the vast open areas south of Route 73 provided the best location at that end of the line for a park-and-ride that could handle a large number of cars.

However, he said, that station alone would fail to serve residents and businesses of downtown Palmyra, so the second station was added.

Also on the minds of those attending the hearing was the question of any additional crime problems the line might create. NJT had its Transit Police Chief Mary Rabideau on hand to talk about her force, which she called "the best-kept secret in law enforcement."

Rabideau acknowledged, though, that the transit police are not a first-response force, and are there to back up local police when they respond to an emergency.

The chief seemed stymied by resident Ed Adair of Washington Avenue, who asked her what the crime rate on the Newark subway system is.

"Extremely low," the chief said proudly.

"Well, we don't have any right now," Adair shot back.

Resident Mary Holloway asked why NJT was intent on putting a line through the riverfront when housing growth and traffic congestion are increasing more in the eastern section of the county.

"Everybody on the other side of Route 130 could be wherever they're going (by car) by the time they drive all the way over here to get on the train," she said.

TABULAR OR GRAPHIC MATERIAL SET FORTH IN THIS DOCUMENT IS NOT DISPLAYABLE

Illustration: photograph

REISTRUP EXHIBIT 2



Virginia Railway Express

A Transportation Partnership

January 13, 1996

-- via telecopier --

Richard H. Young, Jr.
Assistant Vice President
Passenger Services
CSX Transportation
500 Water Street
Jacksonville, FL 32202

Dear Mr. Young:

I am writing to convey the thanks of our passengers for the commitment and superior service rendered to Virginia Railway Express during the "Blizzard of '96." VRE operated every day the week of January 8th, due in no small measure to the efforts of the people of CSXT's Baltimore Service Lane. On Thursday, January 11th VRE provided transportation to 9,649 passengers, a number exceeded only by travel on the date of the Million Man March.

I am not so bold as to believe that we have conquered the forces of nature; nevertheless, I am humbled by the force of the human spirit exemplified in the commitment of CSXT signal and maintenance of way forces. With two months of winter still before us I am confident that any springtime retrospective will say that our best efforts will be both widely appreciated and respected.

With kindest regards.

Sincerely,

Stephen T. Roberts
Director of Operations

cc: Chairman Bulova and Members of the VRE Operations Board
A. R. Carpenter
G. L. Nichols
A. B. Aftoora
F. E. Pursley
E. A. Hill
C. D. Grady
W. V. Bazar

6800 Versar Center • Suite 247 • Springfield, Virginia 22151-4147

TEL: (703) 642-3808
FAX: (703) 642-3820

HOME PAGE: <http://www.vre.org/gotrains>
E-MAIL: gotrains@vre.org



Virginia Railway Express

A Transportation Partnership

January 6, 1997

Richard H. Young, Jr.
Assistant Vice President -
Passenger Service and NRPC Officer
CSX Transportation
500 Water Street
Mail Stop J-315
Jacksonville, Florida 32202

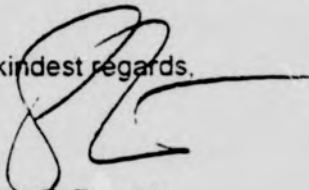
Dear Mr. Young:

I am writing to ask that you convey to your employees our recognition of the contributions made to allow the Virginia Railway Express to receive the 1996 Outstanding Public Transportation System Achievement Award for Urbanized Areas from the Virginia Department of Rail and Public Transportation.

Although we share a rotating plaque only through next October, we have reproduced a copy of an individual plaque on permanent display in our offices. I would be pleased to provide as many copies of this certificate as you may want. The Virginia Railway Express earned the 1996 award for outstanding achievement on the strengths of your management and the dedication of the employees of CSXT.

On behalf of our passengers, the Operations Board, the Department of Rail and Public Transportation and the Secretary of Transportation, thank you for a year of outstanding achievement.

With kindest regards,


Stephen T. Roberts
Director of Operations

cc: VRE Operations Board
Rick Taube, NVTC
Leo Auger, PRTC

6800 Versar Center • Suite 247 • Springfield, Virginia 22151-4147

TEL: (703) 642-3808
FAX: (703) 642-3820

HOME PAGE: <http://www.vre.org/gotrains>
E-MAIL: gotrains@vre.org



Virginia Department of
Rail and Public Transportation

*Outstanding Public
Transportation System
Achievement Award*

Urbanized Areas
Virginia Railway Express
1996



Virginia Railway Express

A Transportation Partnership

June 5, 1998
- via telecopier -

Richard H. Young, Jr.
Assistant Vice President Passenger Services
and NRPC Operations Officer
CSX Transportation
500 Water Street
Jacksonville, Florida 32202

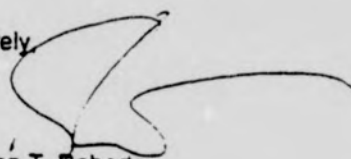
Dear Mr. Young:

The sun is shining and all's right with the world. This morning Senator John Warner, Congressman Tom Davis and members of national and local print and electronic media rode VRE train #306 from Fredericksburg to Alexandria. The train departed, operated and arrived on-time. ABC has indicated that a segment will air on "Good Morning America" Thursday morning, other coverage would be expected this evening or in the morning papers.

The Senator and Congressman as well as the media spoke with a number of VRE passengers who all expressed enthusiastic support for the VRE operations. I have no hesitation in saying that this train represents the CSX Transportation commitment to our customer satisfaction.

With kindest regards.

Sincerely,


Stephen T. Roberts
Director of Operations

cc: A. R. Carpenter
Gerald L. Nichols
A. B. Aftora
Wayne V. Bazar
James L. Larson
E. S. Bagley, Jr.
Edward V. Walker, III
Wade F. Hall
David A. Snyder

6800 Versar Center • Suite 247 • Springfield, Virginia 22151-4147

TEL: (703) 642-3808

HOME PAGE: <http://www.vre.org/gotrains>



Virginia Railway Express

A Transportation Partnership

August 27, 1997

-- via telecopier --

Richard H. Young, Jr.
Assistant Vice President Passenger Services
and NRPC Operations Officer
CSX Transportation
500 Water Street
Jacksonville, FL 32202

Dear Mr. Young: *TRICK*

Under the provisions of our Operating Access Agreement, I am writing to request permission to operate Special Train service for the Promise Keepers Solemn Assembly on the Washington Mall, Saturday, October 4, 1997. The attached schedules are proposed for three round-trips each for Fredericksburg Line and Manassas Line trains. We are working with Amtrak to allow for all VRE equipment to layover in Washington, however as of today we would require two deadhead moves for two train sets in order to provide layover at our Broad Run/Airport yard adjacent to the Manassas Airport. The deadhead returns would be the last two Manassas Line trains into Washington and would operate those two trains as the last two Manassas Line departures. Amtrak will continue to evaluate the storage options, and we would eliminate the four dead-head moves if possible.

Thank you for supporting our recent operations for the Girl Scout specials and the Fourth of July, they were well received and operated smoothly.

Your early reply will be most helpful in allowing us to respond to Promise Keepers. With kindest regards.

Sincerely,

Stephen T. Roberts
Director of Operations

Encl: October 4, 1997 Schedules

6800 Versar Center • Suite 247 • Springfield, Virginia 22151-4147

TEL: (703) 642-2800

HOMEPAGE: <http://www.vre.com>

REISTRUP EXHIBIT 3

Citation
8/14/94 WASHPOST C10
8/14/94 Wash. Post C10
1994 WL 2434818

Found Document

Rank(R) 1 of 1

Database
WP

The Washington Post
Copyright 1994

Sunday, August 14, 1994

OP'ED

Close to Home

Let's Derail the Movement to Spend More on Trains

After reviewing accounts of traffic patterns and the cost of transportation programs in Prince William County for the past few years, I have concluded that money being spent on the Virginia Railway Express and Commuteride (VRE) is a poor investment.

The more we spend, the less people seem to use it. Despite the \$213 million being poured into the VRE to support commuters to Washington, the use of this public transportation by residents of Prince William County has dropped from 3 percent in 1980 to 2 percent in 1990, according to the U.S. Census. Money is being spent to move people to and from Washington, when that's not where the county's people need to go.

For example, according to the 1990 U.S. Census, Washington traffic accounted for only 13,547 commuters (11 percent) from Prince William County. By contrast, 32,934 commuters (27 percent) were going to Fairfax County and a whopping 43,265 commuters (35 percent) were traveling within the county. Yet when it comes to public transportation within the region you really "can't get there from here."

The Virginia Railway Express is overpriced and under-utilized, like other rail systems across the country. It also has failed in a major goal of capturing a significant number of commuters driving alone.

A passenger survey conducted by the VRE in October 1992 showed that only 37 percent (795) of 2,148 riders had driven alone prior to the start of VRE. The others were already using some form of car pool or public transportation. Yet the county and the Potomac and Rappahannock Transportation Commission are moving right along to build a bigger VRE, which will inevitably serve a smaller portion of commuters.

The VRE is supposed to be funded from ticket sales, a 2 percent motor-fuel tax and state grants. But the sum of these revenues is insufficient to cover expenses.

Copr. (C) West 1997 No Claim to Orig. U.S. Govt. Works



8/14/94 WASHPOST C10

Starting next July, \$619,000 in general funds from Prince William County will be used to help pay for the VRE. In planning for fiscal year 1996, which begins July 1, 1995, the VRE already has determined that the level of service outlined in fiscal year 1995 could not be sustained without major increases in local subsidies.

Our elected officials should be making more judicious decisions about the use of general funds. Instead of spending our taxes to support a small number of travelers to Washington, they should be using the funds to meet the needs of the large numbers of transit-dependent citizens who live in Prince William County.

- John J. Cramsey

a resident of Prince William County since 1974, was a transportation auditor for the General Accounting Office from 1967-93.

TABULAR OR GRAPHIC MATERIAL SET FORTH IN THIS DOCUMENT IS NOT DISPLAYABLE
PHOTO,, Frank Johnston

----- INDEX REFERENCES -----

NEWS CATEGORY: LETTER

EDITION: FINAL

Word Count: 437

8/14/94 WASHPOST C10

END OF DOCUMENT

Copr. (C) West 1997 No Claim to Orig. U.S. Govt. Works



Thursday, April 27, 1995

WEEKLY - VIRGINIA

Dispute May Raise Rail Fares for Stafford Commuters

Leef Smith

Washington Post Staff Writer

Stafford County commuters who use the Virginia Railway Express could be asked to pay 12 percent more for every train ticket they buy because county officials have said they will not pay their share of the costs to run the railroad, VRE officials said.

The one-year rate increase, which would raise the cost to commuters traveling to and from the Leeland Road, Brooke and Quantico stations, was proposed Friday morning during a meeting of the VRE operations board to resolve a long-running dispute between the railroad and Stafford County over rail costs.

Stafford's Board of County Supervisors voted last month to limit the county's annual VRE payment to \$750,000 -- about \$25,000 less than the county is paying this fiscal year and \$144,000 less than the railroad estimates the county would owe in the coming fiscal year.

County officials say the decision was made based on escalating rail payments that they consider unfair.

By increasing the fares, riders traveling from the Quantico station, which is in Prince William County but is used primarily by Stafford residents, would pay 65 cents more for every single-trip ticket. Riders at the Leeland and Brooke stations would pay 70 cents more for each ticket.

"Stafford doesn't want to put up the money, so it falls on the backs of the riders," said VRE spokesman Corey Hill. "It's unfortunate, but we've had to get tough."

Fairfax County Supervisor Sharon Bulova (D-Braddock), chairwoman of the VRE operations board, said she doesn't like the idea of making up the lost revenue by levying a surcharge on Stafford riders, but she said the money has to be found if the trains are going to continue running at their current level of service. Earlier this month, the railroad added more rush-hour, afternoon and weekend trains on its Fredericksburg line.

"Sadly, Stafford's decision puts us in a very difficult position," Bulova

said, likening the contentious squabble to a "VRE family fight."

The rate-hike proposal is being forwarded to VRE's governing agencies for consideration at their meetings next Thursday. If it is approved, officials said, the 12 percent surcharge will be publicized and public hearings will be scheduled in Stafford. Officials said the new rate would be in place at the start of the new fiscal

year beginning in July.

Stafford County Administrator C.M. Williams criticized the rate increase as an unfair method of raising revenue.

"The burden should not be put on the backs of those who ride commuter rail from Stafford," Williams said. "The individual citizen should not be penalized."

Other options include asking the five other jurisdictions that share the cost of subsidizing commuter rail in Northern Virginia to pay more in order to make up the difference, or giving the other jurisdictions a subsidy break.

That would lower their payments to be proportionately comparable to Stafford's, a move that would result in reduced service for all commuters.

Bulova says she is not happy with any of the potential solutions.

"No one thinks it's fair that we ask the other jurisdictions to chip in, and I'd hate to see the newly expanded system cut back because of Stafford's refusal to pay," Bulova said.

Among its deliberations last week, the VRE panel also agreed to write a letter to Virginia Gov. George Allen to ask that the state pitch in the money that Stafford has said it will withhold.

Because Stafford collects enough gasoline taxes each year to pay its VRE costs, state officials say, it is unlikely that more funds will be approved.

"I don't see how the state could do it," said Tom Stewart, an engineer for the Virginia Department of Rail and Transportation. "It would set a precedent. If I pay the grocery bill of one jurisdiction I have to pay everyone else's, too, don't I? Everyone one will come running."

---- INDEX REFERENCES ----

ORGANIZATION: VIRGINIA RAILWAY EXPRESS

KEY WORDS: STAFFORD COUNTY; RAILWAY PASSENGER TRANSPORTATION; FARES AND SCHEDULES

NEWS SUBJECT: Transportation & Transit (TSP)

NEWS CATEGORY: NEWS VIRGINIA

MARKET SECTOR: Industrial (IDU)

INDUSTRY: Railroads (RAI)

EDITION: FINAL

Word Count: 635
4/27/95 WASHPOST V01
END OF DOCUMENT

Citation
4/27/97 WASHPOST B03
4/27/97 Wash. Post B03
1997 WL 10690360

Found Document

Rank(R) 1 of 1

Database
WP

The Washington Post
Copyright 1997, The Washington Post Co. All Rights Reserved

Sunday, April 27, 1997

Metro

Virginia Railway, a Service That's Losing Steam; Fare Cut Considered As
Ridership Plunges

Leef Smith
Washington Post Staff Writer

When transportation planners shared their vision for the Virginia Railway Express five years ago, they saw the state's first commuter railway attracting as many as 32,000 daily riders by the end of this year.

That rosy projection, which helped persuade local and state officials to pour millions of dollars into the ambitious project, was based on studies that showed commuters along Interstates 66 and 95 abandoning their cars in favor of the new railway linking Manassas and Fredericksburg to the District.

It hasn't happened. VRE ridership -- which peaked during the February 1996 blizzard, when riders made an average of 8,110 daily trips -- has gone steadily downhill since last summer. With current seating capacity at 12,000 riders each weekday, the commuter line averaged just 7,142 riders daily last month -- a drop of 11 percent from the same period a year before.

The worrisome free fall has VRE officials considering slashing ticket prices by 20 percent, but even that may not be enough to revive the line. If more riders don't come forward, at least two VRE board members now say, the troubled train system should be scrapped.

"VRE has the least impact of all modes of local transportation at the greatest expense," said one board member, Prince William County Supervisor E.S. "Ed" Wilbourn III (R-Gainesville). "How many hundreds of millions of dollars do we have to spend waiting on their prognostication" of success?

Ridership is down about 22 percent from a year ago in Stafford County, causing Supervisor Robert C. Gibbons (R-Rock Hill), a member of VRE's Operations Board, to say that commuters there must either start getting on the train or bid it adieu.

"We're spending a lot of money on this, and the fares aren't

Copr. (C) West 1997 No Claim to Orig. U.S. Govt. Works

