Symposium on the work of Leon N. Moses

February 7, 2014





Leon N. Moses 1924-2013

1950s	PhD Harvard, 1952 Harvard Economic Research Project Northwestern University, 1959	Input-Output Analysis Transportation and industrial location
1960s		
1970s		
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1960s	NUTC Director of Research 1960-64	Urban and regional economics Inland waterways study 65-70
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1970s	Chair, Dept of Economics 1970-72 President, Regional Science Assoc, 1972 NUTC Director 1974-79	Urban area structure Production in time and space 5 deregulation conferences
1980s		
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1970s	Chair, Dept of Economics 157572	
	President, Regional Science Assoc,	Production in time and space
	1972	5 deregulation conferences
	NUTC Director 1974-79	
1980s		Deregulation and safety
1990s		HazMat transportation
		Truck safety
2000s	Retires, 2005	

Program

- 9:30-10:00 Leon Moses' work on Transportation Safety Ian Savage (Northwestern University)
- 10:00-10:30 Production Decisions in Time and Space Lanny Arvan (University of Illinois at Urbana-Champaign)
- 10:30-10:45 Coffee Break
- 10:45-11:15 Buyback Auctions for Fisheries Management John Ledyard (California Institute of Technology)
- 12:00 Memorial Service for Leon and Rae Moses Jeanne Vail Chapel
- 1:15 Buffet Lunch Guild Lounge, Scott Hall

Program

- 2:30-3:00 Leon Moses and Walter Isard: Collaborators, Rivals and/or Antagonists? - David Boyce (University of Illinois at Chicago and Northwestern University)
- 3:00-3:30 Employment Decentralization and Commuting in U.S. Metropolitan Areas Alex Anas (University at Buffalo)
- 3:30-4:00 Coffee Break
- 4:00-4:30 The Elasticity of Substitution between Land and Capital: Evidence from Chicago Daniel McMillen (University of Illinois at Urbana-Champaign)

Transportation Regulatory Reform . . .

Airline Deregulation Act of 1978

Motor Carrier Regulatory Reform and Modernization Act of 1980

(Staggers Railroad Act of 1980)

- 1. Freedom to enter the industry
- 2. Freedom to enter or exit individual markets
- 3. Pricing Freedom

A few years later . . .

"Can we keep the Skies Safe?"	
Newsweek	
January 30, 1984	
	"The Scandal of Killer Trucks"
	Fortune
	March 30, 1987

Deregulation and Safety Conference

- On June 23-25, 1987 NU-TC organized a large conference involving a huge number of academics, industry leaders and government and Congressional figures
- Proceedings the size of a telephone book
- 54 papers



Book

- "Transportation Safety in an Age of Deregulation" edited by Leon Moses and Ian Savage, Oxford University Press, 1989
- 18 papers plus introductory, summary and concluding chapters



What was the empirical focus?

- 1. Safety of the many new entrants
- 2. Safety of existing firms, especially those in financial distress and close to exit
- 3. Expansion of demand leading to congestion and safety concerns regarding the infrastructure
- 4. "Modal shifts" (truck-rail, mainline-commuter airlines)
- 5. Adjustment of safety regulations and enforcement efforts to the new market conditions

Conclusions: Aviation

- "The decline in the nonsafety aspects of service has been extensively documented."
- "The forecasts of some deregulation critics that price competition would cause an absolute decline in safety have proven incorrect."
- "Adherents of the safety stock-congestion theory hold that the record of accidents is insufficient to the task of predicting where the system is likely to go in terms of safety."
- "the federal government has not mounted a major campaign to significantly relieve congestion at major hub airports and in the airspace in their vicinity."

Conclusions: Trucking

- "fail to find evidence of the kind of consumer unrest that characterizes airline travel."
- "The adjusted index of [property damage] accidents per truck-mile fell from 100 in 1978 to 69 in 1985 – a 30% reduction."
- "The index of auto fatalities in truck-related accidents per mile of automobile usage fell by 21% from 1978 to 1985."
- "Economic deregulation has not led to an increase in the fatality rate. Neither has it increased the rate of industrial injuries and illnesses of trucking industry employees."
- "the trucking industry feels strongly that safety difficulties that are identified should be addressed by safety measures, not economic regulation."

Truck Safety Regulation Changes

- 1982 Surface Transportation Assistance Act Motor Carrier Safety Assistance Program (MCSAP) funding to states to conducted enforcement activities
- 1984 Motor Carrier Safety Act uniform national standards for drivers and equipment
- 1986 Commercial Motor Vehicle Safety Act MCSAP funding expanded, expanded national standards including uniform national Commercial Drivers' License (CDL)
- Setting up of the Commercial Vehicle Safety Alliance (CVSA)
- Early pre-Internet safety databases for shippers and enforcement agencies

Hazardous Materials Conference

- For his last conference, a return to his roots
- How might the controversies over hazardous raw materials and hazardous wastes transportation affect industrial location?

Hazmat Transport '91

a National Conference on the Transportation of Hazardous Materials and Wastes June 17-19, 1991

> Hosted by The Transportation Center Northwestern University 1936 Sheridan Road Evanston, IL 60208-4040

Proceedings

Hazardous Materials Conference

- Much public debate:
 - Hazardous Materials
 Transportation Uniform
 Safety Act 1990
 - Oil Pollution Act 1990
 - Sanitary Food Transportation Act of 1990
- June 17-19, 1991
- Proceedings also the size of a telephone book
- 43 papers academics, industry and government



Book

- "Transportation of Hazardous Materials: Issues in Law, Social Science, and Engineering" edited by Leon Moses and Dan Lindstrom, Kluwer Academic Publishers, 1993
- 18 papers plus introductory chapter



Multi-disciplinary issues

- 1. Quantitative risk assessment
- 2. Routing decisions and restrictions
- 3. Risk perceptions
- 4. Placarding and information provision
- 5. Emergency response training and location
- 6. Legal liability
- 7. Insurance
- 8. Federal preemption
- 9. Costs of transportation and pricing

Truck safety work

- 1. "The effectiveness of motor carrier safety audits," *Accident Analysis and Prevention* 24(5):479-496, 1992
- "Characteristics of motor carriers of hazardous materials," in Frank F. Saccomanno and Keith Cassidy (eds.) *Transportation of Dangerous Goods: Assessing the Risks*, University of Waterloo, 1993.
- 3. "Annual license fees and other charges for road transportation of hazardous materials," in Leon N. Moses and Dan Lindstrom (eds.) *Transportation of Hazardous Materials: Issues in Law, Social Science, and Engineering,* Kluwer Academic Publishers, 1993
- 4. "The effect of firm characteristics on truck accidents," *Accident Analysis and Prevention* 26(2):173-179, 1994
- 5. "Identifying dangerous trucking firms," *Risk Analysis* 16(3):351-358, 1996
- 6. "A cost-benefit analysis of United States motor carrier safety programs," Journal of Transport Economics and Policy 31(1):51-67, 1997

Methodology

- Data on 75,000 truck firms
- Merged together files on crashes, firm characteristics, safety audits and inspections
- Data arrived on magnetic tapes (nowadays the data is publicly available on a website)
- Used negative binomial regressions on a count of crashes (quite novel in accident analysis at that time)

Firm size and reportable accident rate



Accident rate & firm characteristics



"Northwestern University has given transportation its own, less consequential, version of Fleischman and Pons [the "discoverers" of cold fusion] in the form of professors Leon Moses and Ian Savage. A controversial Moses-Savage safety study, released at a hazardous materials safety conference earlier this month . . . "

Editorial, Traffic World, July 1, 1991

Government safety audits

- Only 5 of the 45 items investigated by inspectors were significantly positively related to crash rates
 - Reporting of accidents to the government
 - Internal investigation and disciplinary process
 - Knowledge of hours-of-service rules
 - Tracking of driver's hours-of-service
- 16 of the 45 items had significant counterintuitive relationship (noncompliant firms had better crash rate)

Identifying dangerous firms



Costs & benefits of audits and inspections

1992 \$ millions	Firm Audits	Roadside Inspections	
		Upper Bound	Mid-range
DIRECT BENEFITS (mainly reduced crash costs)			
Total benefits	1370.9	219.8	151.5
COSTS			
Government Costs	36.3	72.7	72.7
Firm Inspection Costs	8.6	101.9	101.9
Higher Operating Costs	278.1	-	-
Deadweight loss (less freight traffic)	7.9	0.1	0.1
Total costs	330.9	174.7	174.7
BENEFIT-COST RATIO	4.21	1.26	0.87

Including a "deterrence effect"

Deterrence effect as %	Benefit – Cost Ratio		
of direct effect	Firm Audits	Roadside Inspections	
		Upper	Mid-range
		Bound	
0	4.14	1.26	0.87
25%	4.24	1.63	1.27
50%	4.31	1.94	1.60

October 24, 1924 – October 12, 2013



Friend

Leader

• Scholar