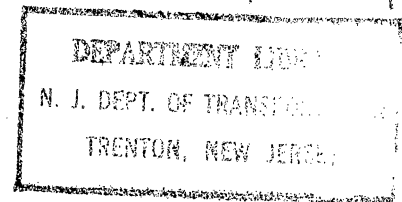


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TRANSPORTATION AND ENVIRONMENT
ACTION AND REACTION

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THE SPENCER MILLER, JR., LECTURE SERIES
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Spencer Miller not only was a pioneer in his advocacy, leadership and accomplishments in introducing concepts of landscape design into the practice of highway engineering, but was also a remarkably versatile educator and scholar. He maintained a wide-ranging interest in humanity and varied his activities as circumstances afforded an outlet for his many talents.

Today, I am confident, Dr. Miller would have enlarged his concern for highways in harmony with their immediate surroundings to the far greater challenge of achieving transportation systems compatible with communities they serve. He most certainly, I am sure, would have been in the forefront of Earth Week and Earth Day observances and leading the effort to sustain their admirable objectives.

It would seem, therefore, an appropriate recognition of Dr. Spencer Miller's memory, and the constructive contributions he inspired over the years, by the New Jersey Roadside Council, as well as those of the Civil Engineering Department here at Rutgers University, to expand the theme of the 1970 lecture and deal with several aspects of "Transportation and Environment - Action and Reaction."

Transportation, for the past two centuries, has been a field of virtually unceasing action which has developed the complex of systems that,

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together with communications, support an ever more populated world. Transportation, an indispensable part of the Industrial Revolution, has vastly expanded the availability of the material things of life--both necessities and the luxuries--for much of the world. It has afforded opportunity for the spread of civilization insofar as man has been able to utilize its services for the good of man.

Yet, transportation has also expedited change both in man's relationship to other men, and in the environment in which it exists. And not all change is for the better.

Some have resisted change just because of change despite almost certain rewards as a result of change. Others, more perceptive, have foreseen undesirable consequences and have opposed change on rational grounds, while a few have sought to direct and adopt change in the constructive interests of mankind.

The coalescence of such varied forces opposing, resisting or seeking to modify actions to expand transportation facilities and to expedite transportation services has, in the past decade, produced increasingly severe reactions. Now, in the 1970's these reactionary forces are posing serious questions about further progress in transportation because of its seeming threats to ecological processes and environmental amenities.

Odd as it may sound to a 1970 audience which includes many university students, transportation improvements--mainly canals and roads--were eagerly sought for by the citizens of the 1700's. Ours was a primitive land of abundant natural resources and sparsely populated. Accessibility was a prime requisite to achieve more than a bare existence as well as social contact.

"By 1771," wrote Dunbar in his "A History of Travel in America,"



"The public demand for hurry as a prime consideration of travel had become so marked that the trip from New York to Philadelphia was made in a day and a half, and the proprietor of the pre-Revolutionary express (i.e., a stagecoach) which sped over the distance in that amazing time was blessed with inspiration--he named his wagon "The Flying Machine." And soon thereafter, a trip from New York to Philadelphia in the "Flying Diligence" was made in 16 hours of actual travel time--Brunswick was the breakfast stop and Trenton for dinner.

As Dunbar wrote, "Local circumstances, the weather and the state of the roads still ruled traffic with almost arbitrary power." No uniformity of travel conditions existed and the traveler never knew what to expect and what delays he might encounter--almost like air travel today! "There had been born within the people an impatience that in time was to work the marvels then unconceived."

In rapid succession came a series of internal improvements to link the scattered centers of population along the Atlantic Coast and to tap the then developing Ohio Country west of the Appalachians. Canals and improved waterways, the post roads and the National Pike--the early steam boats, stagecoaches and the Conestoga wagon overland, moved steadily mounting numbers of people and the goods of commerce.

A drastic change in the environment was underway--the wilderness was cleared, farms took over from woodlands, towns and cities grew. Each vied with the other for better connections to the west and civic support of transportation development was not only a duty but a virtue.

New Yorkers promoted the Erie Canal; Baltimore, the National Road or Pike (and succeeded in gaining Federal aid) and Philadelphia, the Pennsylvania Improvements--a combination of canals, roads, inclined planes and river navigation to reach Pittsburgh. New Jersey, after

several false starts, in 1786 granted John Fitch an exclusive franchise to construct steamboats and to navigate its waters by steam power and thus spurred investment in transportation that was to attract Robert Fulton and his powerful backers--Chancellor Livingston among others, and later Commodore Vanderbilt of railroad fame.

By the 1830's the railroad appeared on the American scene and speeded the changes in landscape which have not yet ceased. It began a period of vigorous transportation action which has persisted to this very day--the motor vehicle and then the airplane accelerated and varied the action, but every form of transportation and expansion of its services have been broadly welcomed as evidences of progress and superiority.

Americans long were proud of their transportation systems and honored the engineers who created, designed, located, built and operated them. Even in 1956 when the Congress approved the 41,000 mile system of Interstate and Defense Highways, there was almost universal public approval of what was elatedly described as "the greatest public work of all time." There was serious concern about the availability of materials and manpower to get the roadways built fast enough to meet the popular demand.

Despite the popularity of transportation in the public mind, there were, to be sure, sporadic outbreaks of opposition brought on by the fears of change but certainly not by any concerns for the environment. Steam engines belched unpleasant soot and cinders, and housewives near railroads complained of the dirt and noise and worried about their children wandering in the path of trains. The only determined opponents were those spurred by the threat of "economic pollution"--the intrusion of a fancied or real competitor which might adversely affect an established enterprise.

Post roads were opposed by the pack train operators who had a



good thing going for them on the trails of early America. Innkeepers and stagecoach operators fought the early railroads because they foresaw their business speeding past on the faster, more reliable trains. One of John Fitch's steamboats was destroyed, and later Fulton's Clermont was unsuccessfully sabotaged by river men and barge operators who feared the competition.

In 1854, the works of the Wabash and Erie Canal in Indiana were attacked by mobs who opened dikes and burned trestles to destroy its usefulness. Again though, the motive was economic, not civic indignation at a high pitch. The insistent public demand for mobility prevailed and action on the transportation front continued unabated.

Interestingly, there were a few dissenting souls who quietly questioned whether such improvements were really beneficial to man. Nine miles an hour was claimed as the maximum speed which the human body could healthily withstand--faster than that, it was predicted, would prevent normal breathing. But more serious were the numerous accidents which took an increasing toll of life--steamboats had boiler explosions, fires and sinkings; trains had their boiler blow-ups, their collisions and derailments--and in time the public concern brought about regulation, first by states and then by the Interstate Commerce Commission and other Federal agencies to bring travel safety again within human tolerances.

The current reactions--far more sweeping than those in the past--stem not from any diminishing demand for transportation, but rather from dissatisfaction with the way in which it is conducted and the disastrous impact of mass movements channeled improperly through lack of alternatives, and lack of desirable combinations of facilities. Somehow, transportation development in the post-World War II era, and particularly in the last decade, has gotten out of phase with the general welfare.



Discomfort, delays, congestion, accidents, loss of shipments and countless other irritations to the traveler and shipper; noise, air and visual pollution to the neighborhoods through and over which transportation movements occur; and the inducements to exploitation of lands suddenly made accessible--suburbanization of rural areas increasingly distant from cities, blatant resorts in scenic spots, and the intrusion of crowds in the remaining wilderness: all of these are the current impacts of transportation on the environment. The wave of reaction is understandable.

Nevertheless, I think that patience, diligence, sensitivity and vision which characterized the earlier generations of American engineers who created what was once the world's finest transportation services can correct and redress the present situation. We, and they, can most surely restructure our means of movement so as to serve mankind and our environment for the better despite increasing population.

Many of you, no doubt, at some stage in your schooling have heard and repeated that presumably unanswerable question, "What happens when an irresistible force meets an immovable object?" But then is an answer--"Inconceivable chaos."?

If we are to avoid a chaotic and inglorious end to a wonderful world and its space, we must bring about a disciplined application of force--resist the irresistible and move the immovable to spread the benefits and minimize the risks of technical progress. In a pioneering way, Spencer Miller inspired an aspect of that disciplined approach and laid the basis for enhancement of the highway environment. Now, we must transfer such concepts to all of transportation--land, water and air--to contribute to a better life--to utilize action and reaction for human progress.

