

**JOURNAL OF THE  
BOSTON SOCIETY OF CIVIL ENGINEERS**

**Volume 57**

**OCTOBER 1970**

**Number 4**

**MASS TRANSIT IN THE '70s**

by

WILLIAM J. RONAN\*

(Address delivered before a joint meeting of the Boston Society of Civil Engineers and the American Society of Civil Engineers at Boston on July 13, 1970.)

You have asked me to talk about "Mass Transit in the 1970s". I am pleased to do so. But first let me express my dislike of the phrase "mass transit" which unfortunately has been widely accepted. Because what you and I are really concerned about is not the movement of a mass or masses, but the travel of individuals by public transport in urban areas.

If I belabor the point it is because there must be more recognition and acceptance of this basic fact — by government, by industry and by labor. I stress it also because my colleagues and I, members of the Metropolitan Transportation Authority, are committed to an all-out effort to impress upon the transit industry — the operators and managers, the work force and the manufacturers of transit equipment — that our concern is with moving people — human beings — and not with just manipulating equipment or playing trains. A bus carrying people is not a truck. A subway or commuter train carrying people is not a freight train. This is a simple concept, but not easy to enforce.

The comfort, convenience and reliability of public people transportation is entering upon a new age — and it is about time!

Frankly, we have lost a whole generation in the development of public people transportation. For forty to fifty years we neglected our commuter

\*Chairman, Metropolitan Transportation Authority, New York, New York.

railroads, our rapid transit rail systems, and our bus and trolley surface lines. This "Dark Ages" of public transport was of course the "heyday" of the private automobile. In the nation's enthusiasm for the individual auto — and the building of highways, expressways, and super-expressways — the public transport sector was starved for funds, ignored, and permitted to deteriorate.

The private automobile opened new vistas for the average American, afforded him a freedom of movement and choice of location unparalleled in history. The automobile is still crucial in our society for today and tomorrow — but its place in urban living is being reassessed because of traffic congestion, cost, pollution and the increasing competing demands for land in our urban and metropolitan centers. There were 25 million automobiles registered in 1945. Twenty years later, 1965, there were 75 million. If current rates of population and auto ownership projections hold, there would be a doubling of automobiles — 150 million — by the year 2000. If there is not enough land to accommodate the highway demands in our urban areas now, just how can such increased demands be met?

The past forty to fifty years has brought about an imbalance in transportation that clearly must be corrected. Nationally and in our metropolitan and urban centers we must have a more balanced and more integrated transport system. Each mode of transportation — rapid transit, commuter rail, bus, aircraft, automobile or other means — must be used as appropriate and in coordination with each other as will best serve the present and emerging need. In this balanced and coordinated approach, public people transportation must play a key role. Yet in this fiscal year 1969-1970 just completed Federal funds for highways were \$2.2 billion while Federal aid for mass transportation was a mere \$214 million.

The 1970s will see a change, and I believe, a major change in the public attitude toward and public support of mass transportation. The 1970s will be the first full decade in the renaissance of public people transportation. This renaissance is already under way.

In the early 1970s the wholly new Bay Area Rapid Transit System in San Francisco will begin operation — ushering in a new era for development in that metropolitan region. This will represent 20 years of effort by enlightened local leadership. Here in Boston, in Philadelphia, in Pittsburgh, and in Chicago new lines or extensions of existing rapid transit lines will be constructed. In Washington, D. C. the new subway will be built bringing relief to the impossible traffic problems of the nation's capital.

In the New York metropolitan area, my own agency, the Metropolitan Transportation Authority, will build at least 52 new miles of subway, al-

ready started, and modernize all of the rail commuter services in the New York State portion of the metropolitan region at a total cost of \$2.1 billion.

The 1970s will also witness the development of rapid transit between major airports and the core city areas. One of the most devastating comments on the airport planners and city planners of the past 30 years was their total neglect of rail and mass transportation to airports. In New York, Chicago, Los Angeles, San Francisco — in every major metropolitan area — sole reliance was put on motor cars, even though at many of these airports, rail or rapid transit lines were adjacent or but a short distance away. Cleveland, Ohio, opened its subway link to its airport in 1969. Imagine it — until this subway extension, not one major airport had such a rapid transit link.

In New York we will connect Pennsylvania Station in Manhattan with Kennedy Airport by express Long Island Rail Road service. You will be able to check your bag at Penn Station and claim it when you get to London or Karachi or wherever. You notice I said "claim it". I am not prepared to guarantee delivery. It now takes up to an hour and a half to get to Kennedy Airport from mid-Manhattan. Our service will deliver you and your baggage in 19 minutes!

Airports in Chicago, San Francisco and other major centers will, I believe, develop rapid transit connections. In California, Los Angeles has received this year a Federal grant for feasibility studies, Preliminary engineering, and marketing studies for a tracked air-cushion vehicle system to connect Los Angeles International Airport with the San Fernando Valley.

In the planning of large new commercial airports or jetports in major metropolitan regions, rail or rapid transit access will be a necessity. Not only will the volume of traffic require it, but the probable distance of such airports from the center city areas will be such as to require it as well — if people are to get to such airports in an hour or less.

The 1970's will also see the development of transportation centers, places where there are rapid transit stations with feeder bus lines converging, with extensive private car parking and "kiss and ride" facilities. Some of these centers will also have general aviation facilities, and hopefully also STOL aircraft facilities.

In the New York region, our Metropolitan Transportation Authority has acquired two airports and is operating them as general aviation facilities. The airports are Republic in Farmingdale on Long Island, and Stewart west of the Hudson near Newburgh, New York. Both sites will become major transportation centers. At Republic the extension of electrification of the Long Island Rail Road will be completed in 1972 and bring that airport to

within 30 to 35 minutes of Penn Station, Manhattan. The airport has already doubled in its use, and the addition of parking facilities and new bus and railroad station facilities will make it a key transportation center on Long Island.

At Stewart Airport in Rockland County we will build a spur from a nearby railroad and develop that field into a major transportation facility as well. This field is located in a developing part of the New York region with a promising potential for a cargo airport as well as other general aviation use.

The decade of the 1970's will see improvement in the equipment and other facilities for mass transportation — and some major breakthroughs in this dimension.

In New York we will no longer order passenger equipment that is not air conditioned. We buy only air conditioned buses and only air conditioned subway and commuter cars. Of our bus fleet some 10 per cent is now air conditioned, and we have 610 air conditioned subway cars in service with 240 more on order.

We are also trying to find a way to fit air conditioning units into the cars we operate on the IRT division, one of the three separately-built rapid transit systems now operated by the New York City Transit Authority. The IRT was the first subway system built in the City, and seventy years ago who ever heard of air conditioning? Its tunnels are smaller in width and in height, so small that we haven't yet found an air conditioning unit that will fit into IRT cars and still leave enough headroom for passengers. We recently contracted with an aerospace firm to design a slim, trim air conditioner, and encouraging progress is being made.

The Long Island Rail Road will have a fully air conditioned fleet when its modernization program is completed by the end of next year.

The technology of rail transportation, like old Rip Van Winkle, has been sleeping for 40 years. It was roused from its comatose state by the public outcry for more attractive and non-polluting transport systems, accompanied by the tinkle of public monies earmarked for transportation improvements.

Hopefully that tinkle of money will become even more audible with the help of Congress — a matter which I will go into further in a few moments.

As for the technical challenge, it lies in three major areas:

- (1) to find faster, more reliable and yet economical means of propulsion
- (2) to find the hardware to satisfy local transportation requirements in densely developed central city areas.

- (3) to seek the means to reduce or eliminate air pollution, noise and other unwelcome intrusions in an already chaotic urban scene.

In the first area there are difficulties in intergrating and coordinating the various systems. As I mentioned earlier, our IRT subway system has tunnels which are smaller than those of the other two branches of the New York subway system. Our commuter railroads use Diesel locomotives that can also run on electricity, and electric self-propelled cars. Some commuter rail lines draw power from the third rail; on some of these, the power is picked up from the underside of the third rail, on others from the top. Other electrified lines use an overhead power supply system, but they don't all use the same current.

To make all these systems fully compatible would be an impossible task. But we are using technology to solve some of these problems. We are now testing on the Long Island Rail Road a self-propelled car which uses a gas turbine engine to generate its own electricity on non-electrified lines and can also operate on third rail power. If the tests prove to be successful, this car, which accelerates as rapidly as our new high performance electric cars, will enable us to improve passenger service on lightly-travelled lines without electrifying at all. On heavily travelled lines, it is more economical to electrify, and we're doing that now on one branch of the Long Island which is presently served by Diesel-hauled trains.

In the congested centers of urban areas, we are seeking new transportation systems to solve a public transportation problem. Buses move little faster than pedestrians on crowded city streets. Little time is saved by walking down to a subway platform, waiting for a train and going just one or two stops.

So we are trying to break some new ground by installing a people-mover system across 48th Street, one of the most congested streets in midtown Manhattan. We have reviewed several hundred proposals for this system, some of them pretty exotic. Our engineers have selected seven or eight of these concepts which they think have merit, and we will continue the elimination process until we have a plan for a system that will offer rapid, convenient transportation through crowded urban centers. It might turn out to be something similar to a moving sidewalk or continuously moving small tracked vehicles, but it will be aimed at making it easy and convenient for people to get around.

We are increasingly aware of the need to eliminate pollution in all forms. Our buses are now the most pollution-free vehicles on New York City streets as a result of a program we instituted several years ago to reduce their exhaust emissions. We have applied for a federal grant to enable us to

evaluate buses that run on batteries. The energy formerly given off as brake heat to stop these vehicles would be used to recharge their batteries every time they come to stop, and we would have recharging stations at both ends of the line to bring their batteries back to full power.

We have also asked for federal funds to evaluate another technological advance which, we think, would reduce the amount of power required to run our subway system. The less electricity used, the less power plant exhaust there is for the power companies to worry about. I am referring to the stored energy car. It is a subway car which has two compact flywheels beneath the passenger section. When the motorman stops his train, the controls automatically reverse the fields in the traction motors, changing them from consumers of power to generators of power. The power they would then generate would start the flywheels spinning. The train would slow down, just as it would going up a hill, because it is doing more work. When the train is ready to start up again, the spinning flywheels would be used to drive generators which would deliver power to the traction motors, reducing the need for external power.

At present, the energy removed from a train to stop it is dissipated as heat. The stored energy system, by reducing the amount of conventional braking, reduces the amount of heat in the system. That in itself would improve the subway environment. The environment in the subways would benefit through another spinoff of the stored energy car — the screeching of brakes would be reduced.

The most significant technological breakthrough, however, may be the linear induction motor. This system applies the principle of magnetism to make possible a practically silent, very high speed, pollution free transportation system. As we all know, if you take two magnets and place them next to one another in one manner they'll be repelled. By inducing an electric current into one element of the linear induction motor, magnetizing it in effect, and placing it next to another piece of metal of opposite polarity, power is created to propel a public conveyance. By controlling this power through channels and guideways, a useful public transportation system can be created.

The U.S. Department of Transportation has recently granted funds for development of an air cushion vehicle powered by a linear induction motor. That, I think is the public transportation system of the future.

The U.S. Department of Transportation has also made grants to us for many of the things I have talked about. It is paying part of the cost of our modernization program for the Long Island Rail Road, and has pledged

funds for part of the cost of improving other commuter lines in New York State.

These technological advancements are far from being blue sky projects. The major thing standing between us and their implementation is in the magnitude of dollars that can be assigned for this vital purpose.

It has become quite clear to us during the years that Rip Van Winkle was sleeping, that mass transportation is not an urban fringe benefit — it is a fundamental factor in our survival as a modern society.

Research and development programs in this critical area atrophied because, as a people, we had not assigned the priorities of purpose and commitment to mass transportation that we had for example, to a national space program.

The need for a national mass transportation program has been apparent to every straphanger and every commuter who must endure the ordeal of a daily journey to work on antiquated systems. Yet, somehow, this obvious fact has eluded our lawmakers and our national administration leadership until almost the eleventh hour in the lives of our cities and their suburbs.

The most hopeful sign on the national front comes in the form of the mass transportation bill now pending before congress. In HR18185, currently before the House, we could expect \$5 billion in mass transportation assistance over a period of years. This large sum could be committed immediately, thus insuring the industry that planning, design and development could be pressed ahead without fear of cutback.

Another hopeful sign is the willingness on the part of local, regional and state jurisdictions to face up squarely to the matter and initiate capital programs that are being financed through a number of bold approaches.

In New York State, our voters sanctioned a \$2.5 billion transportation bond issue of which \$1 billion has been earmarked for mass transportation. Here in Massachusetts you have turned cigarettes into a blessing by using a portion of their tax proceeds for transportation financing. Similarly, Connecticut and Pennsylvania have moved ahead with transportation financing programs, as have cities such as San Francisco, and Washington, D.C.

Despite significant starts in these areas, we have only touched a small part of the total problem. Cities throughout the nation are crying out for mass transportation relief — and the large supermetropolitan areas could use all the available and currently projected funds to satisfy merely their most pressing of transportation needs.

Clearly massive federal aid is the answer.

Aid to capital projects, however, is only a partial answer. The huge oper-

ating deficit incurred in public transportation points the way to the need for major subsidies.

This need is as apparent to the small bus operator struggling to provide a service in a small city as it is in New York's \$600 million annual transit operation. The spiralling cost of labor, services, and materials coupled with the problem of operating services during the dead offpeak hours mark mass transportation as a poor profit maker — and in most instances, a decided loser.

The belief that the farebox could sustain capital and operating costs has been the primary culprit in our nation's mass transportation paralysis over the past decades.

While we have seen heavy national subsidy for the auto and the airplane in various guises, as a people we sat on our hands in complacent belief that somehow the railroads and public transport systems would make their own way.

The result has been deleterious imbalances which threaten our urban circulation systems — and economic starvation which will now cost us many more dollars in public assistance and equitable subsidy programs during the post World War II period.

It is clear that the public must recognize the need for an all-out effort to revive and nurture America's passenger transportation systems. This means the assignment of public dollars on a broad enough and flexible enough basis to meet both capital and operation requirements during the decade to come.

Like an atomic explosion, we must have enough critical mass — in the form of dollars — to get the kind of results we are seeking in providing for the mobility of our nation.

Given this base upon which to build, I am sure that the skills and talent — such as is represented in this very gathering — can be harnessed not only to meet the challenges of the '70s, but go on to anticipate the exciting demands of the century to come.