Rapid Transit: A Look Into Kansas City's Future

by Dwight Pennington

What kind of wheels will Kansas Citians be riding on 10 or 20 years from now?

Or is that ancient invention, the wheel, about to be supplanted by vehicles supported and propelled by magnetic force, speeding over guideways with no more noise or friction than is caused by the rushing air?

Such vehicles already exist. I saw them on test tracks in Munich, Germany, in October — 12-passenger Personal Rapid Transit cars for urban use and a long, sleek unit for intercity travel at speeds up to 300 miles an hour.

Back home, I came down to earth.

On a visit to the High Speed Ground Test Center of the U. S. Department of Transportation at Pueblo, I learned about a more practical, gradual approach to public transit improvements.

Also, at the offices of Kansas City Transit Associates, I talked with Robert A. Snowber about the special needs and problems of the Kansas City area.

Finally at City Hall, I asked Mayor Charles B. Wheeler, Jr., his ideas on the future of public transportation.

"I'm a rapid transit buff myself," the mayor said. "I've ridden transit in Paris, Mexico City and San Francisco — and I've enjoyed it."

But personal liking must not be allowed to stand in the way of practical solutions for Kansas City as a whole, the mayor continued, and answers won't be cheap — or easy.

Snowber's planning team has studied proposals with Kansas City price tags from $160 million to $1.7 billion (1973 dollars).

Beyond the question of cost, my inquiries showed that Kansas City has its share of negative factors:

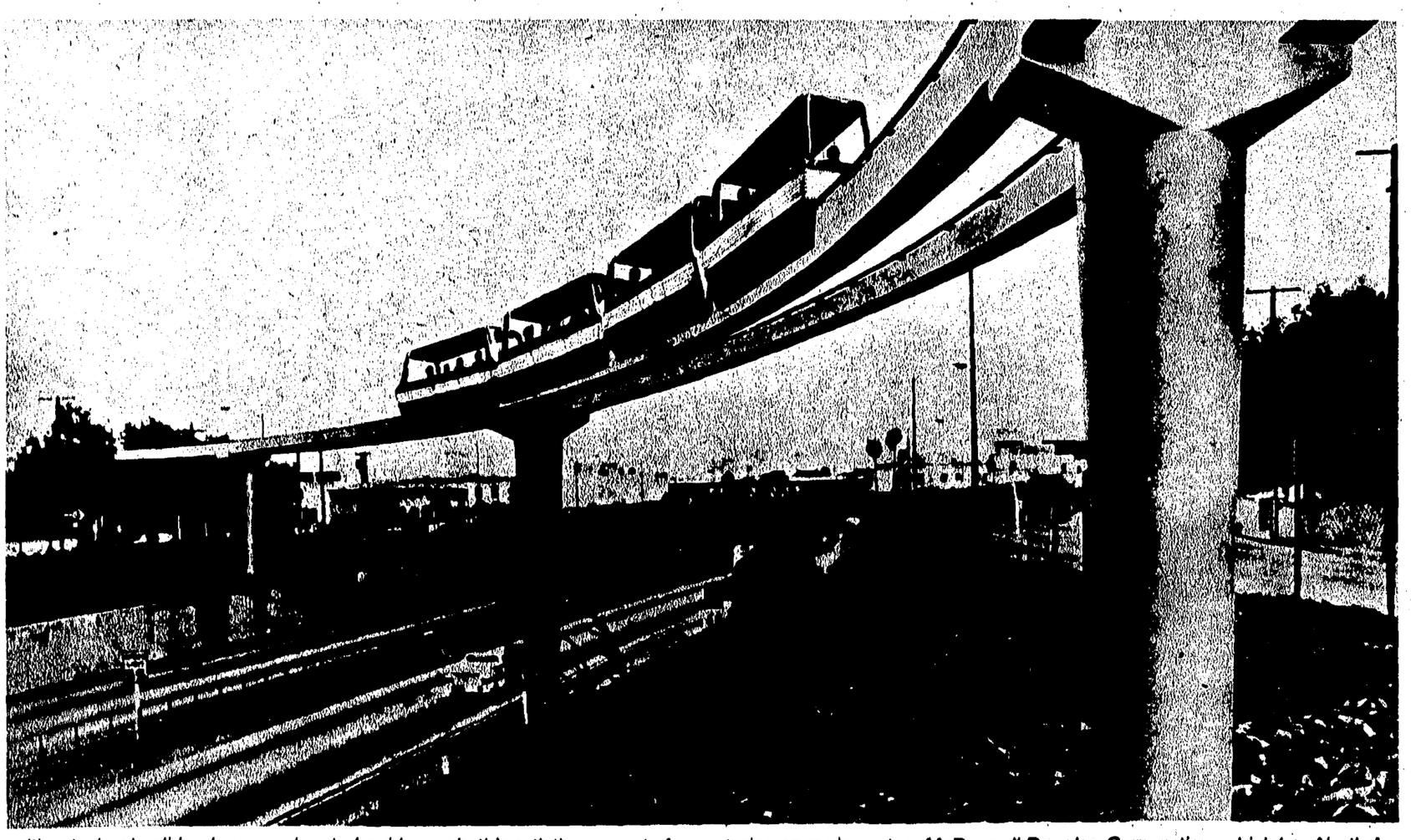
- The Kansas City of today is a product of the automobile. Only 2 per cent of all trips within the metropolitan area involve public transit.
- Low density of population makes it difficult to attract the numbers of riders needed to make mass transportation profitable.
- Even the most attractive public transportation is unlikely to persuade large numbers of Kansas Citians to give up, voluntarily, the free-wheeling independence of the private motor car.
- Kansas City's highway system—"One of the better ones in all of the cities I've been in," says the knowledgeable Snowber—encourages use of the automobile.
- Most Kansas Citians are happy with their metropolis, and would be reluctant to accept any transport system that would change its nature.

But change may come, regardless of personal desires, and it may come soon.

"I predict the petroleum shortage is going to be here in full force in about three years," Mayor Wheeler said. "When it hits, I don't want people to say, 'Why weren't you planning mass transit?'"

Even if a fuel crisis is postponed, practical reasons dictate increasing use of public transportation. Consider:

- The private motor car is an expensive, wasteful way of getting to and from work. Snowber believes the cost to the car owner, including hidden factors, is at least $5 a day, compared with perhaps 80 cents by public transport.
- To park a car all day long, and use it perhaps 30 minutes morning and evening, "is ridiculous," says Snowber.
- If fuel shortages do not limit the use of motor cars, traffic congestion will be a growing problem. Consultants' studies show that the I-70 route, for example, is badly congested today, and cannot economically be improved.
- Modern busses and rail vehicles produce less noise and air pollution than automobiles



Cars without wheels glide along an elevated guideway in this artist's concept of a Transurban train. The 12-passenger units are being tested at the Krauss-Maffei plant in Munich, West Germany. Controlled by computer, the cars operate on branch lines, throw switches automatically and couple themselves into trains on main routes. McDonnell Douglas Corporation, which has North American rights to the system, is developing a proposal for its use in Los Angeles. For Kansas City it is at best a distant dream.

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The cost would be high, but so could driving an automobile by 1985

carrying an equal number of riders.

• Mass transit, properly designed, can help to give the city a central focus, a real entity. Private automobiles are a centrifugal force, promoting such developments as peripheral shopping centers.

• Kansas City has a special opportunity for underground transportation in the heart of the city. The Bethany Falls limestone stratum, underlying the area from the Missouri River to the Union Station, is ideal for subway tunnels.

Mayor Wheeler comments: "I still think of the Union Station as the transportation hub of the city."

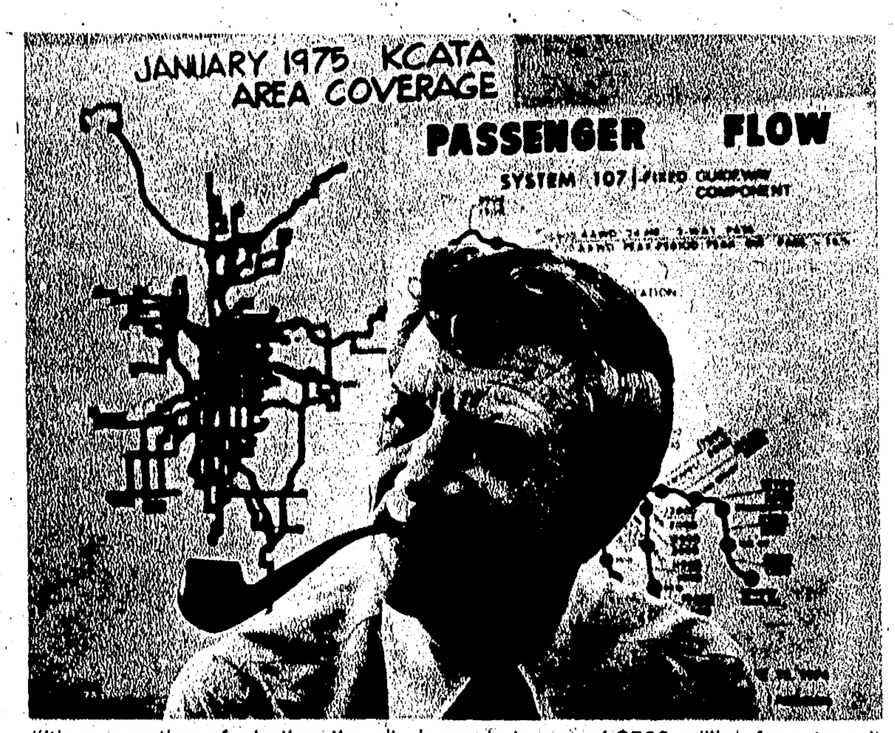
The mayor expressed confidence in the future of a city center served by improved public transit.

"Americans are very astute in recognizing trends," he said. "There is now a centripetal force that will cause the core city to grow, compared with the centrifugal force.

"Tied with transit development, I look for a new type of compact housing in the center city — housing that is safe, and economical enough that lower and middle income people can invest in it and own it."

An interim report issued in November by Transit Associates arrives at a provisional system to meet Kansas City regional needs for the next quarter-century. It suggests, for public discussion and refinement, an all-bus plan costing $300 million. This would involve local service that would feed express busses using preferential traffic lanes and some separate new busways. An option including 24 miles of "fixed guideways" on main routes would cost $550 million. These are 1973 cost levels.

"Fixed guideways," as used in the report, means rails. Use of the term recognizes that guideways



"It's a question of whether the city is ready to spend $500 million for a transit system"... Robert A. Snowber, Kansas City Transit Associates.

Kansas City planners put together ideas for tomorrow's ATA

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of other types — for vehicles riding on magnetic or air cushions — are in the picture for the future.

If the secretary of transportation approves, it is possible that the federal government might pay up to 80 per cent of the cost. The balance, the interim report suggests, might be financed with the ½ per cent sales tax now assessed in Kansas City, Mo., for public transportation. But the mayor and other leaders believe the remaining 108 municipalities and the other governmental units in the 2-state metropolitan region should pay their share.

Snowber of Kansas City Transit Associates agrees that the idea of subways downtown has great appeal. The New York firm of which he is vice-president for transportation, — Parsons, Brinckerhoff, Quade & Douglas, Inc. — was founded by Barclay Parsons, who designed the first New York subways in the 1890s. The consultant group here includes also the Kansas City firm of Howard, Needles, Tammen & Bergendoff, and Wolfgang G. Roeseler. The million-dollar planning project they have undertaken, under Snowber's leadership, is sponsored by the Mid-America Regional Council. Final conclusions are expected to be ready by June.

In addition to MARC, the ATA, the city, State Highway Departments and other local governments are participating in the study.

Decisions on details, such as a subway option, depend on public and local government reaction, and approval at state and federal levels.

"It's a question of whether the city is ready to spend $500 million for a transit system," Snowber said. "You can't use busses underground."

Speaking of downtown subways, I saw in Munich how the heart of a city can be served by urban transit underground. This is true in other cities, too; but Munich has interesting similarities to Kansas City. Its population, though more concentrated, is comparable to that of Greater Kansas City. And the main railroad station, the Hauptbahnhof, is on one side of the city's center; its river, the Isar, on the other side.

The excellent modern rapid transit system, the S-bahn, goes underground at the Hauptbahnhof and emerges beyond the Isar. The historic central plaza, Marienplatz, is a preserve for pedestrians — shoppers, tourists, diners, playgoers, citizens on business errands, visitors to the historic City Hall with its famous glockenspiel. Unseen and unheard, S-bahn trains come and go at the Marienplatz station, underground.

It was in Munich that I saw the potential public transportation of the future — levitated and propelled by magnetic force — on test tracks at the big Krauss-Maffei factory. But for the present, and near future, Munich's operating S-bahn seemed more pertinent to this visitor. My wife and I rode it several times in a 6-week stay. We found it always fast, smooth, comfortable — and on time.

In Kansas City, the "fixed guideway" option in the provisional plan of Kansas City Transit Associates would cost about $553 million. It visualizes a 14-mile north-south line from Vivion Road to Waldo. South of 31st Street it would parallel Broadway, and then the old Country Club street car right of way. Its 18 stations would serve North Kansas City, Downtown, Crown Center, Penn Valley Community College, Westport, the Country Club Plaza, the Nelson Gallery, the University of Missouri-Kansas City, the Brookside Center and Waldo at 75th Street.

Kansas City International Airport does not generate enough traffic at present to pay for a rail line or separate busway, Snowber said, even taking into consideration the 8,000 or so TWA employees and other airport workers. It may in the future, as industries and housing grow in the area.

An east-west line would run from the Blue Ridge Mall and the Truman Sports complex to the H. Roe Bartle Convention Center. It would have 12 stations.

Cars running on these lines would be of a type called SLR, or Standard Light Rail vehicle. Developed for street railway systems in the Boston and San Francisco areas, they are not to be confused with San Francisco's controversial, more sophisticated BART (Bay Area Rapid Transit) vehicles. They will be tested at the Pueblo center as soon as available, probably in May.

Faster and more comfortable than street cars in the past, the SLR vehicles are versatile. Overhead trolleys permit use at surface level with grade crossings if desired (third-rail systems must have separate right of ways). SLR vehicles are about 70 feet long, but articulated — or hinged — in the middle to enable them to make sharp turns. They can be operated singly, or in tandem.

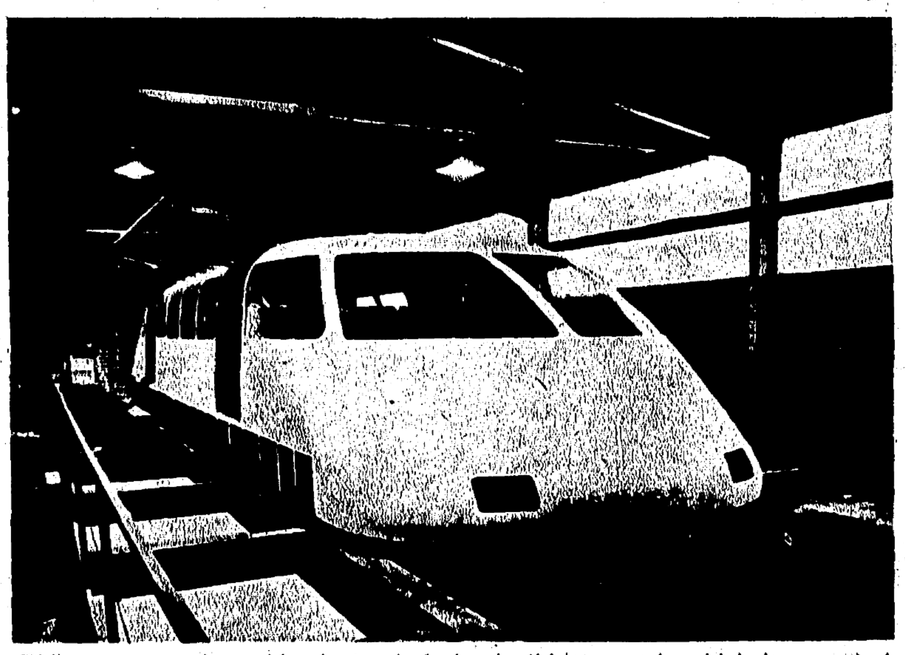
Each has seats for 68 passengers, and room for about 140 standees. Two double doors on each side can be adjusted hydraulically to permit passengers to board from ground level or high platforms.

The Kansas City Transit Associates call the vehicle metro-K-Car, with the K inserted above the other letters to defeat normal typesetting. About 50 would be used on the projected 24 miles of rails. An artist's concept of such a vehicle on the old Country Club line, passing the Central United Methodist church at 52nd street, appears on the magazine's cover.

The provisional system includes 1,040 miles of local and feeder bus routes, about three times the local service now provided. (Mayor Wheeler was somewhat disturbed by citizens' preoccupation, at public hearings, with local service in their particular areas, rather than the general good of the city.)

The busway option includes 335 miles of express bus service, much of it on preferential lanes, some on separate new busways. Most of these routes would be retained even if the "fixed-guideway" plan is adopted. But rail lines underground would eliminate the surface construction of bus lanes and stations required for express bus service into the center of the city. Cost estimates include only about half as much for "Transfer Stations, Shelters and Special Controls" with the fixed-guideway system as with the all-bus option — $30.6 million against $60.2 million. It should be noted, though, that in all other categories — Construction and Right of Way, Engineering and Management, and Vehicle Purchase — the fixed-guideway expense is higher.

Major parking areas for transit riders' cars, called Park'n Ride facilities, are proposed at 17 sites. There would be 50 main transfer stations, and 1,200 bus shelters.



Riding a magnetic cushion instead of wheels, this research vehicle is expected to reach 300 miles an hour. That would make possible a one-hour run from Kansas City to St. Louis. Propelled by linear induction, it has reached 180 m.p.h. on a 2-mile track at Krauss-Maffei, Munich.

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Involved in the decision on rapid transit will be the costs, like gasoline, and the effect of air pollution

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About 850 full-size busses would be required for the ridership expected by the year 2000. Plans call for use of the sleek new Transbus tested in various cities, including Kansas City, under sponsorship of the UMTA (Urban Mass Transit Administration) of the federal Department of Transportation. These 40-foot busses have air-conditioning, increased glass area and comfortable seating. About 50 van-type minibusses would provide local and Dial-a-Ride service.

"The plan is considered provisional," says the interim report, "until the public has had an opportunity to review and comment."

In addition to the alternate provisional systems, the report analyzes five other plans. It dismisses a proposal for commuter service along present rail routes entering the city. The railroads have shown little interest in the idea, Snowber says, and the lines for the most part do not run where the need is greatest.

The five "test systems" have been analyzed as to capital cost, estimated ridership by the year 2000, annual revenue and operating expense, and social impact. The two bus systems included are relatively inexpensive in first cost, $200 million for one, $160 million for the other. Computed daily ridership of 175,000 to 229,000 on the first would leave annual operating deficits of $25 million to $31 million. The other bus plan could be expected to attract 203,000 to 264,000 riders a day, but would still have deficits of $22 million to $27 million.

The other three "test systems" involve "fixed guideways" of lengths varying from 58 to 74 miles. First cost would be far higher — $1.38 billion to $1.67 billion. But projected ridership is larger, too, from 210,000 to 302,000 a day. In consequence operating deficits, put at $26 million to $33 million a year, are not dramatically greater than for the less expensive bus systems.

In addition to the greater efficiency of steel wheels on rails compared with rubber tires on pavement, Snowber mentions larger capacity and more rapid acceleration of rail vehicles. He also notes a factor which might be decisive — the prospect of serious petroleum shortages. Most of Kansas City's electricity is produced by coal, so electric-powered transit vehicles here could importantly reduce the need for petroleum.

While the chief argument for all-bus transit is the lower capital investment, Snowber cites another. The bus system can be developed in stages, and expanded or changed as needed. The proposed rail system, to be efficient, would have to be put into service as a whole.

In Mayor Wheeler's opinion, fare reductions would be more effective than advanced design in luring riders.

"I'm for a continued lowering of fares," he said, "which are best set at 25 cents. I have recommended a graduated nickel decrease in fares, followed by a study of ridership."

In most of my discussions on transportation's future, I found the dollar factor stressed. Yet the overall saving of mass transit in comparison with the motor car was not summed up.

Perhaps a rough estimate can be made from Snowber's belief that it costs $5 a day to drive a private car to work, and $4 or more of that could be saved by the person using public transit. If those figures represent true costs in fuel, materials and other economic factors, the total meaning of a switch to mass transportation is impressive.

Ridership of 200,000 — near the lower end of the figures suggested in the consultants' studies — would mean 100,000 round trips a day. Assuming 250 working days, each rider would save $1,000 a year, on the basis of $4 a day. And total savings would be $100 million.

Estimated operating deficits of $20 million to $30 million a year would be offset by such savings, and the figures do not take into account such factors as reduction in noise and air pollution, not readily measured in dollars.

Can riders be lured to public transportation by improved service or advanced technology? I asked Mayor Wheeler if he had considered so-called Personal Rapid Transit, with small cars moving at intervals as close as 30 seconds.

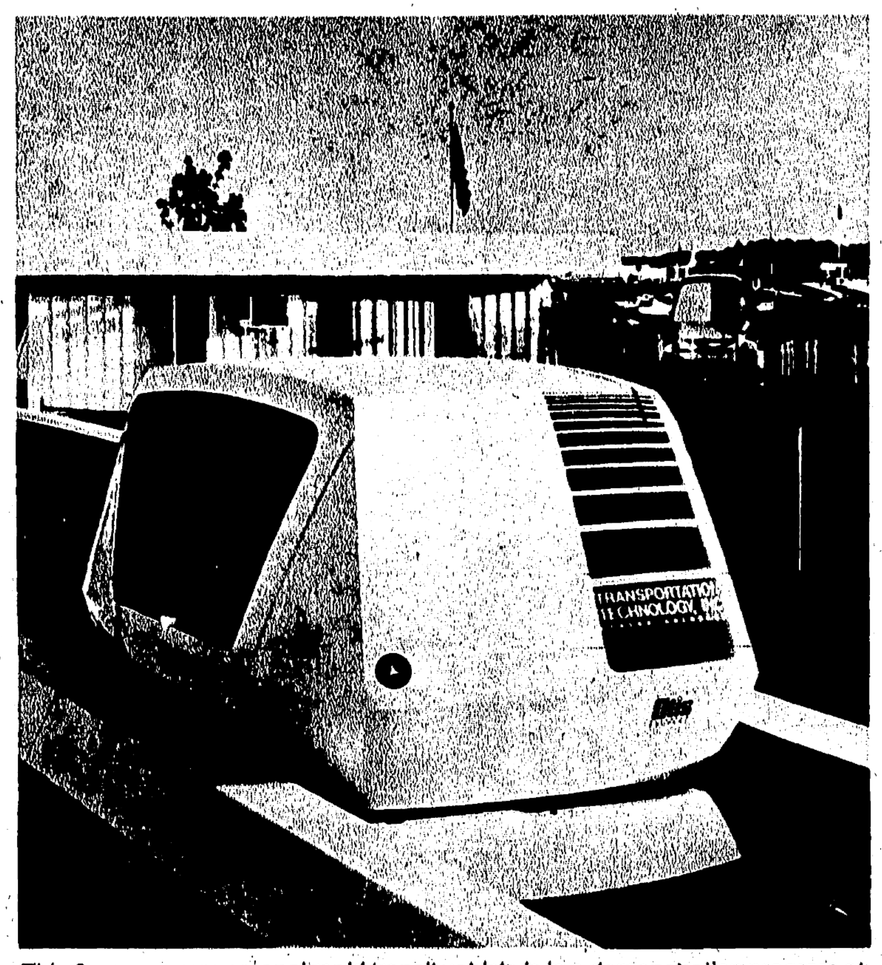
"I've looked into PRT," the mayor replied, "and I'm not impressed."

Robert Snowber believes such systems may be used some day, in limited areas with special needs. But he notes that preliminary experiments have been discouraging. A widely heralded PRT development on the campus of the University of West Virginia at Morgantown has been such a financial and technical disaster as to make the federal government cautious in committing funds for advanced design.

There little cars running on 2 ½ miles of track are to be summoned by pushbutton to carry students between widely separated buildings. The initial appropriation of 18 million dollars later was supplemented with 65 million dollars more. Estimates are that an additional 65 million will be needed for completion.

Problems with San Francisco's BART (Bay Area Rapid Transit) have contributed to skepticism.

Snowber believes that BART is now on the way to successful operation. Less sophisticated than PRT, it involves advanced techniques in design and electronics, including automation. But people are not ready for full automation of public transit, Snowber believes. He notes that the Westinghouse company, planning a new system for Pittsburgh with fully automatic 28-passenger cars, has decided that public demand requires an operator aboard each car. ▶



This 6-passenger personal rapid transit vehicle is in a demonstration program at Dulles International Airport. The vehicle, powered by a linear induction motor, travels on an air cushion.

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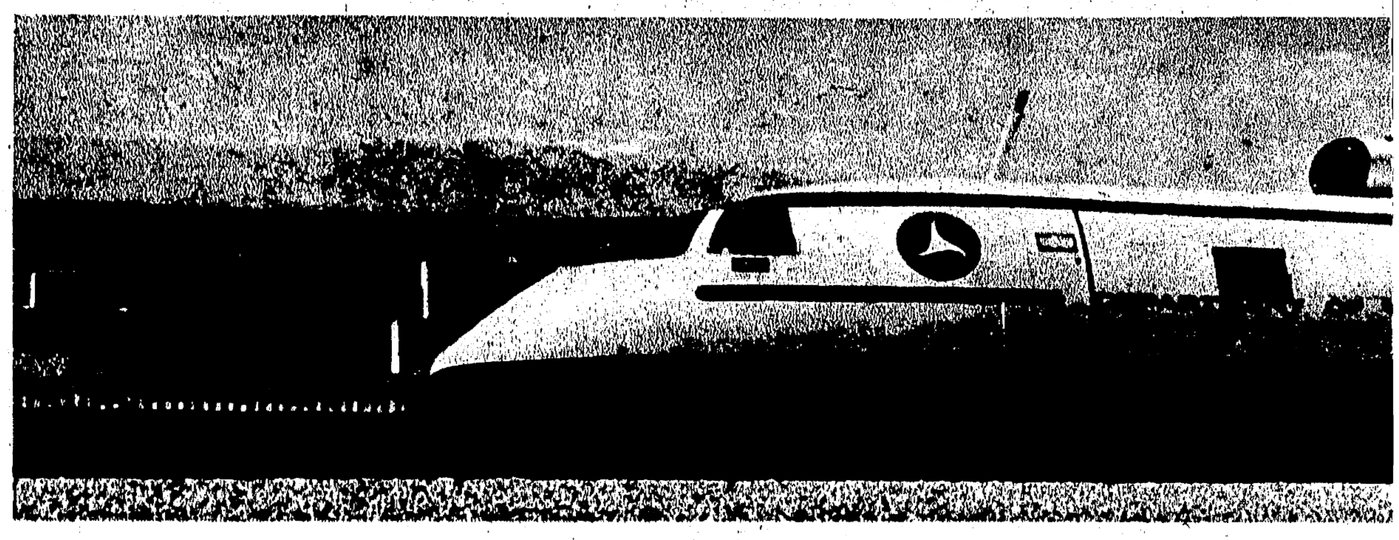
A less versatile new design, for third-rail operation, has passed its basic tests. Called SOAC — State-of-the-Art Cars — these units embody the best techniques immediately available. The prototype 2-car train is now being tested in regular service in five large eastern cities, one after another.

With the SOAC units away, the most "advanced" urban transport I saw on a visit to the Pueblo center in December was a pair of 10-year-old New York subway cars. The 2-car train, rattling around a 9-mile test oval, looked and sounded like others I had ridden in their home city.

A computerized test unit stood head-high in the center of one of the cars. But out of sight beneath the floorboards was the reason for the cars' visit to Pueblo. Sets of 750-pound flywheels there are expected to cut the electricity used in daily operation by about 30 per cent.

The flywheels realize an old dream of engineers. They conserve much of the energy now lost in friction and heat as trains brake to a stop. A basic principle of physics, inertia, is put to work to store energy in the flywheels, which then provide as much as 80 per cent of the power needed to start the train again. Since starting is the time of peak power consumption, the units can cut substantially the electrical demand of the transit system.

Testing at Pueblo has confirmed engineers' calculations of the flywheels' value. Now the cars are being returned to regular ser-

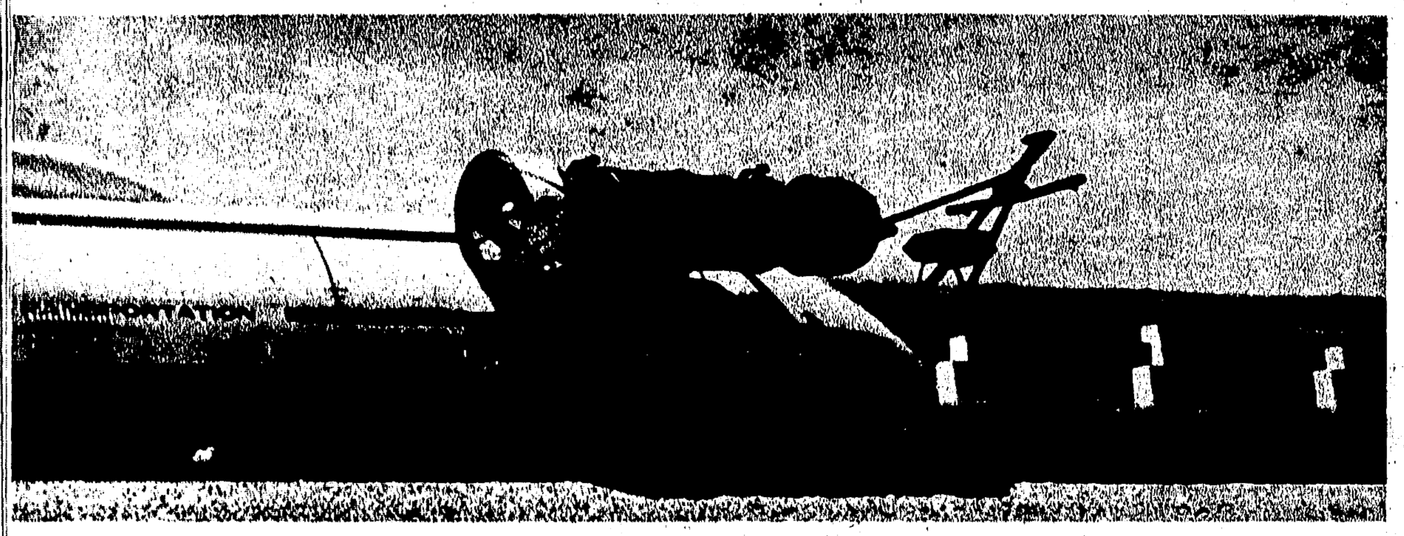


vice in New York. If they meet this final test, general use of the flywheel principle is expected to follow.

A new Canadian train called LRC — for light, rapid and comfortable — was tested there in October and November. Only at Pueblo could the Canadians find the special facilities needed to check their train's endurance, fuel economy, stability and other factors before putting it into regular service.

"The LRC demonstrates what can be done simply by upgrading standard equipment," said our guide, Dick Melton. "Using diesel power, it runs safely at speeds up to 120 miles an hour on available rails. The cars have a low center of gravity. They also have a system of powered banking within the cars themselves. With this they can exceed rated speeds on curves, with safety. The tilt is so adjusted to the curve that the passenger feels no centrifugal force."

A visit to the Pueblo center ends with the conviction that urban and intercity mass transit can be improved in the years just ahead, in comfort, speed and safety, using techniques and equipment now available or under development. Dramatic changes will require more time, but they are on track - or, rather, on the guideway. ▲



The fastest thing on rails (left) reaches 255.7 m.p.h. at the High Speed Ground Test Center of the U. S. Department of Transportation, Pueblo, Colo. Propelled by magnetic induction, it has electromagnets which react in sequence with a metallic strip in the guideway—a sort of electronic motor without moving parts.