ROHR INDUSTRIES

modern transportation systems

THERE ARE ALTERNATIVES

Watching a major metropolitan freeway at 5:15 p.m. on a business day, two things are immediately apparent. One, that traffic is moving at a pace far below design speed of the freeway. Second, most of the cars carry only one person, the driver. And also apparent is a pall of poisonous fumes.

There has to be a better way. There is a better way, something better than the automobile and better than most existing public transportation.

At Rohr we are dedicated to designing and building that better way – alternate modes of travel that are fast, safe, comfortable, quiet and pollution-free. These are not easy requirements but we are convinced that they are attainable and that we now have the necessary technology.

Chairman and
Chief Executive
Rohr Industries, Inc.

MOBILITY... NEW CON

As a diversified designer and manufacturer of transportation systems, Rohr Industries, Inc. is today devoting a major part of its energies and resources to the development of new concepts in public transportation. Rohr is applying a system approach to the problem, based upon the philosophy that movement of people and goods must become more efficient across the entire spectrum of public transportation. Obviously, we have accomplished little if we move the traveler more rapidly and efficiently on one stage of his journey, only to leave him at the mercy of an antiquated system on another stage.

In general, it is Rohr's objective to develop economically viable systems that will operate at maximum speeds compatible with distances to be traveled between station stops. Each system must, of course, provide comfort, convenience and safety for the passengers. And each system must operate without degrading the environment.

Within these guidelines, Rohr is developing improved systems in three basic speed/distance categories. At the lower end of the speed/distance scale is a personal transit system for major airline terminals, city core areas, large college campuses and possibly large shopping center complexes. Such systems would normally be computer-controlled and would operate at low speeds consistent with the short distances between station stops.

At the next level is the metropolitan area public transportation system. Analysis shows that while most major metropolitan areas can best be served by a combination of high-speed rail vehicles and transit buses, no one combination or vehicle can be considered a panacea. Special vehicles and combinations of special vehicles will be required to fulfill special, and constantly changing requirements. Rail transit vehicles such as those built by

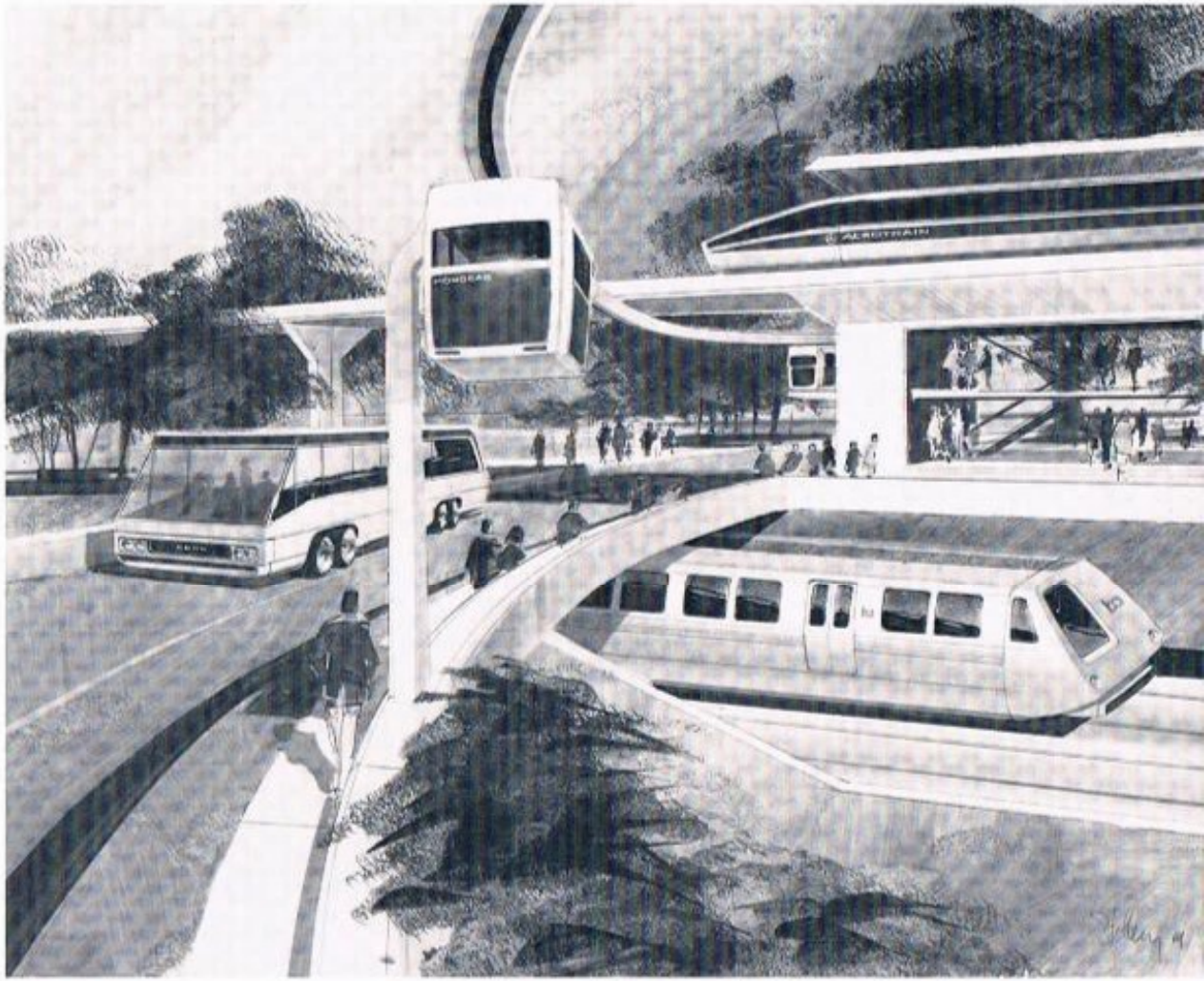
CEPTS IN BALANCED TRANSPORTATION SYSTEMS

Rohr for the San Francisco Bay Area Rapid Transit District and Washington Metropolitan Area Transit Authority offer substantial improvement over existing systems. New transit buses which Rohr is developing will offer greater passenger appeal and substantially reduce air pollution.

At the next level of the speed/distance scale is the guided or tracked air-cushion vehicle (TACV) to operate at speeds of 150 miles an hour or more on airport access or high-density intercity routes. Rohr holds a leading position in this field through acquisition of a majority interest in a United States subsidiary of the two French firms that pioneered in the research and development of the guided air-cushion vehicle, and is pursuing actively the development of such high-speed, pollution-free systems.

In addition, intensive research and development work on the use of magnetic levitation and propulsion for ground transportation systems has been underway at Rohr since 1970. While passenger travel on magnetic vehicles is several years away, the technical feasibility of such systems has been established by Rohr engineers and results to date are most promising.

Rohr and its subsidiaries are bringing to the ground transportation industry many years of experience in the design and manufacture of large, complex and precise structures and in the systems analysis approach to product design and development. To supplement this capability, the company has added a group of management and engineering specialists with extensive experience in ground transportation. Rohr's management is convinced that this combination of talent and experience offers unique capability for the design and manufacture of the truly modern transportation systems required today.



RAIL RAPID TRANSIT

Rohr design for an advanced aluminum subway car being built for Brussels, Belgium, developed under a licensing agreement with La Brugeoise et Nivelles that extends Rohr rail car technology to markets outside the United States.

11,850-square-foot computer-controlled structural test facility.

Rohr Industries' Rail Transit Division draws upon the full resources of the company – modern and extensive manufacturing facilities, an array of scientific disciplines and 30 years of aerospace experience – in the development and manufacture of rail transit vehicles.

Extensive manufacturing capability exists at Rohr plants located in several parts of the country. In addition, specialized facilities developed specifically for rail rapid transit vehicles include:

- 137,000-square-foot rail transit assembly building at Chula Vista.
- 126,000-square-foot rail transit assembly building at Winder, Georgia.
- 52,000-square-foot fiberglass fabrication plant at Los Angeles.
- Structural Test Facility using a computer-controlled, closed-loop servo system, most advanced owned and operated by any car builder in the United States.

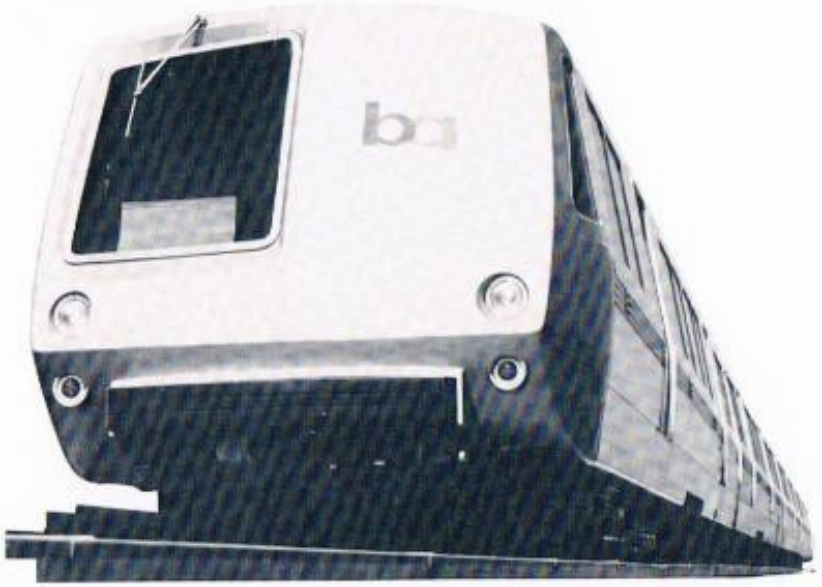
Aluminum rapid transit car for new Washington, D.C. Metro System. Rohr has a contract to build 300 cars at its Winder, Georgia assembly plant.

BART General Manager Bill Stokes points out features of car console to former Secretary of Transportation John Volpe.

BART

Specialists with long experience in the many technical fields involved in rail transit have been added to Rohr's aerospace engineering talent to provide an outstanding technical team.

Rail transit cars built by Rohr for San Francisco's Bay Area Rapid Transit District represent the latest innovations in design, manufacturing technology and passenger appeal features. In every respect these cars are adapted to the needs of the modern metropolitan transit system. The prototype test program developed for the BART cars was the most intensive effort of its kind in transit history. In appearance, comfort, safety and efficiency the BART car is designed and built with passenger appeal as the foremost consideration.



Cantilevered seats and carpeted floors offer unusual passenger comfort, and greatly simplify maintenance.

THE FLXIBLE® BUSES

The 40-foot Flxible coach accommodates 49 to 53 passengers comfortably. Rear-mounted engine and full air suspension provide an unusually comfortable ride. The 35-foot coach for lower density applications offers the same basic advantages.

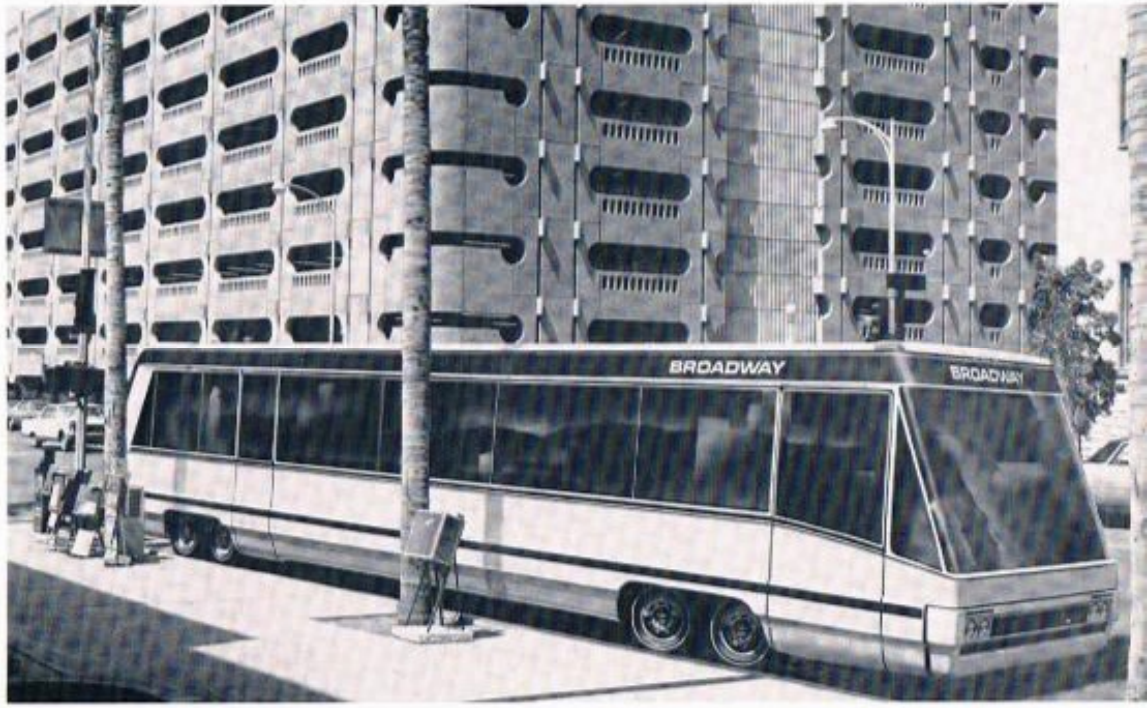
Ease of maintenance, durability and passenger comfort are characteristic of Flxible-built seats.

NEW TRANSIT BUSES ARE ON THE WAY

Rohr has committed its resources and innovative talent to the development of a new family of transit buses suited to the needs of today. Current research efforts are showing progress toward the development of transit buses with pollution-free propulsion systems, more attractive appearance, improved safety features, new and better materials, greater passenger convenience and comfort. Rohr is the first to adapt the low emission LNG (liquefied natural gas) technology to volume bus production.

Exhaust from engine of LNG bus does not smudge white handkerchief.

Advanced bus is being proposed to the Department of Transportation for consideration as standardized design for future use. Bus will be much quieter and emit less pollution than present buses, and passengers will enjoy air-conditioning, carpeting, air-suspension ride and floor heights less than half that of present buses to greatly improve ease of entry and exit.



AEROTRAIN® TRACKED AIR-CUSHION VEHICLE (TACV)

Advanced TACV, designed by Rohr Industries, currently in the test stage.

Aerotrain is an advanced high-speed ground transportation system for medium-range, high-density traffic.

Automatically-controlled Aerotrain cars are supported by low-pressure cushions of air and propelled by quiet, pollution-free electric linear induction motors to speeds over 150 miles per hour.

The cars straddle an aluminum rail set in a concrete guideway with the rail both guiding the vehicle and acting as a motor reaction rail. Aesthetically pleasing guideways can be elevated, on ground or in tunnels, and can be built within existing railroad and highway rights-of-way. Aerotrain guideways are less expensive to build than conventional tracks or roads, and are less expensive to maintain because there is no direct contact of the vehicle with the guideway to create wear.

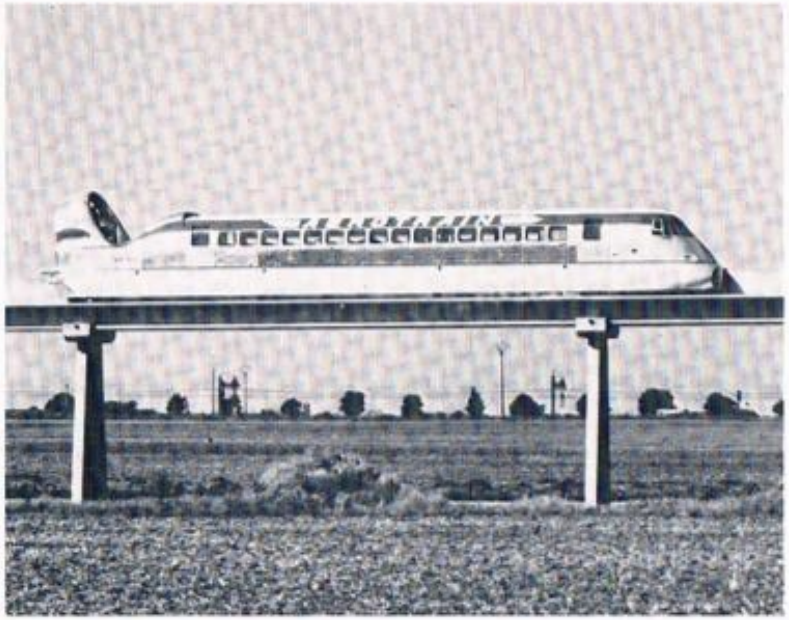
Spacious, carpeted car interiors with two-and-two seating, air-conditioning, wide-view windows and a noise level half that found in an average automobile provide superior passenger environment.

More than 30 million dollars and 14 years have gone into Aerotrain development. Rohr has worked since 1969 to extend the original French technology into an advanced system that will provide high-speed airport access and intercity travel at low cost with minimal environmental impact.

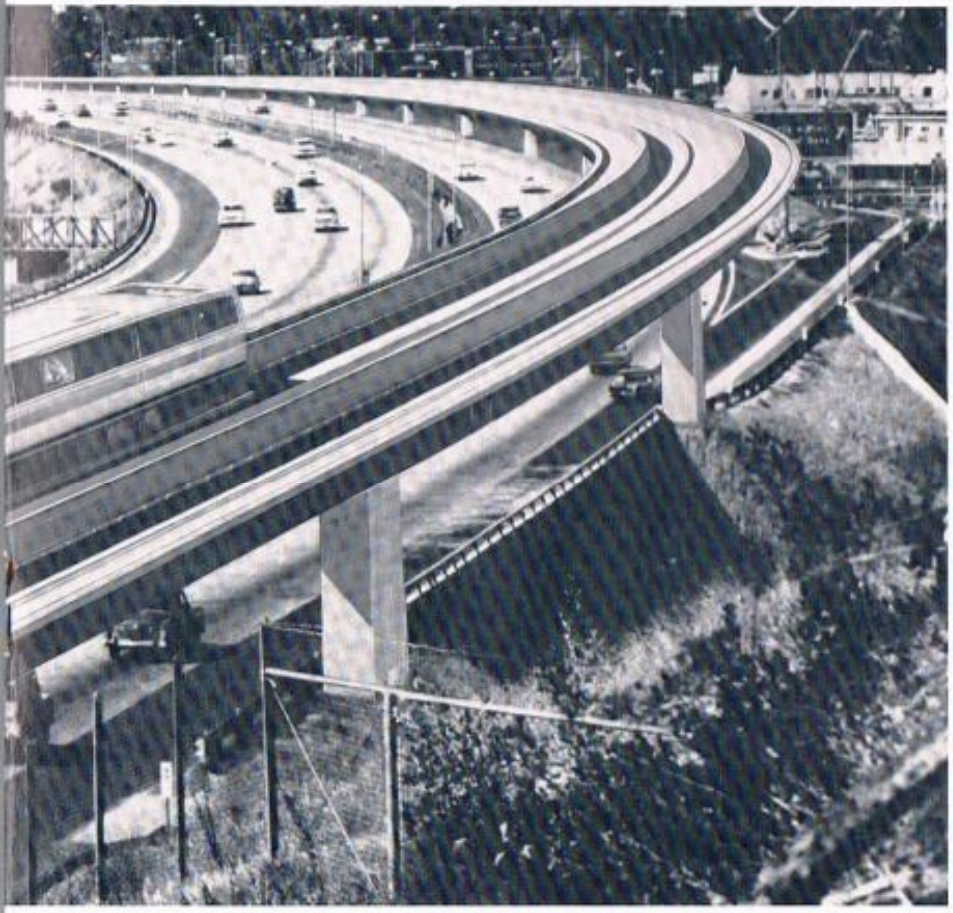
DEPARTMENT OF TRANSPORTATION—TACV

Rohr is developing an advanced tracked air-cushion vehicle under contract from the Department of Transportation. An operating prototype TACV is being tested, first at Rohr's Chula Vista plant and then at the DOT test center near Pueblo, Colorado. The 94-foot-long vehicle will carry 60 passengers and their baggage at speeds up to 150 miles per hour.

A 44-passenger TACV being demonstrated near Paris with a linear-induction motor. Rohr's Aerotrain Systems subsidiary has drawn upon the French technology.



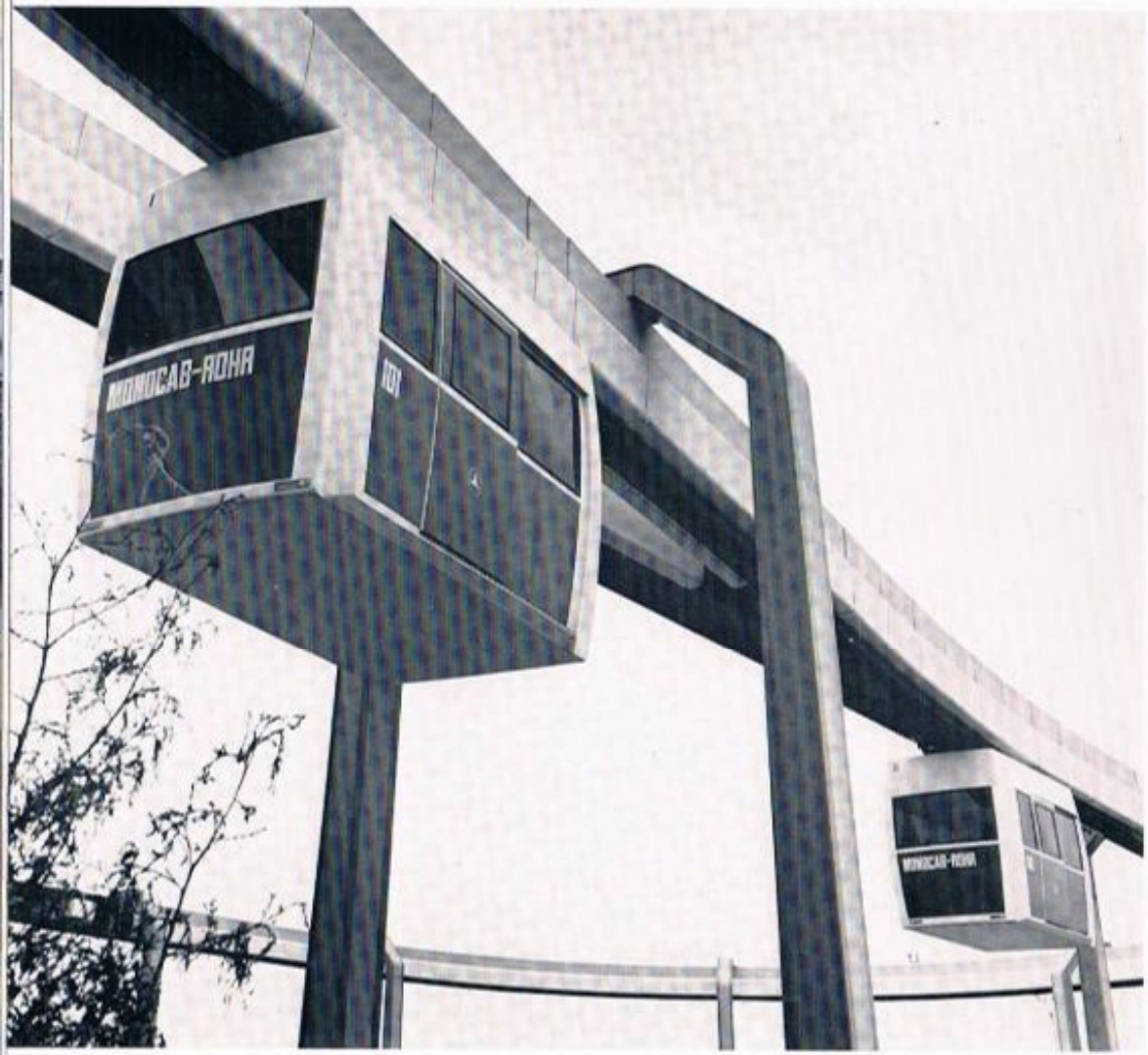
Eighty-passenger air-cushion vehicle in operation near Orleans, France. Speeds up to 265 miles per hour have been reached by Aerotrain test vehicles.



Aerotrain may utilize median strip or sides of existing publicly-owned highways as a right-of-way, thus eliminating one major cost factor.

MONOCAB™ PERSONAL RAPID TRANSIT SYSTEMS (PRT)

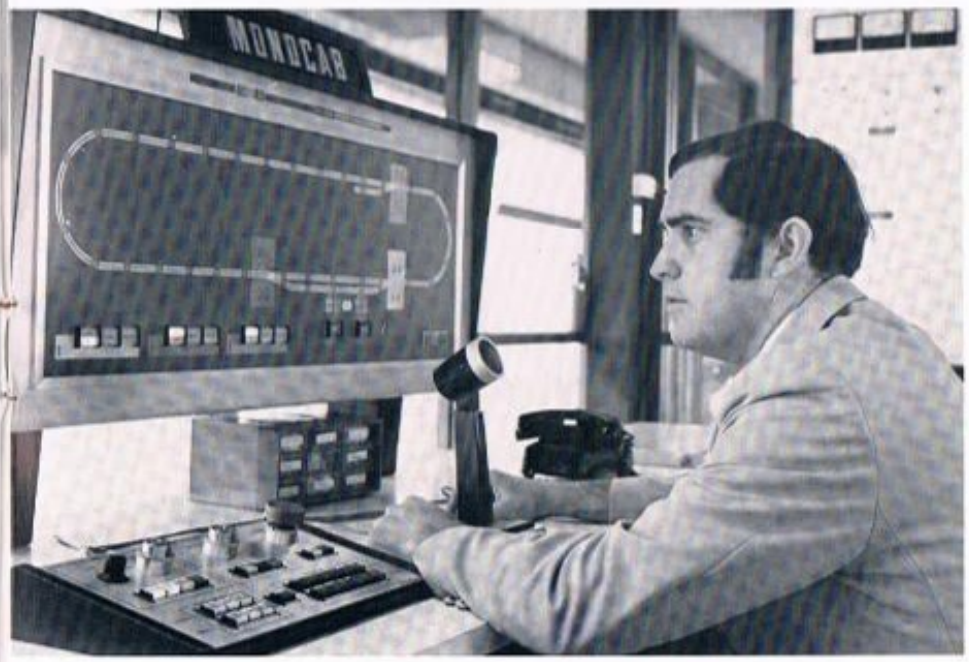
At the low end of the speed/distance transportation spectrum is the Personal Rapid Transit System for airline terminals, city core areas, large campuses and major shopping centers.



Between airline terminals or to the parking lots, in busy downtown shopping malls or between "megaversity" classrooms, wherever busy people need to move within major activity centers, Monocab Personal Rapid Transit (PRT) will move them quickly and safely. Without interference from pedestrians or automobile traffic, the air traveler, shopper, or student, along with baggage, parcels and books, may ride comfortably in automatically-controlled vehicles to his preselected destination.

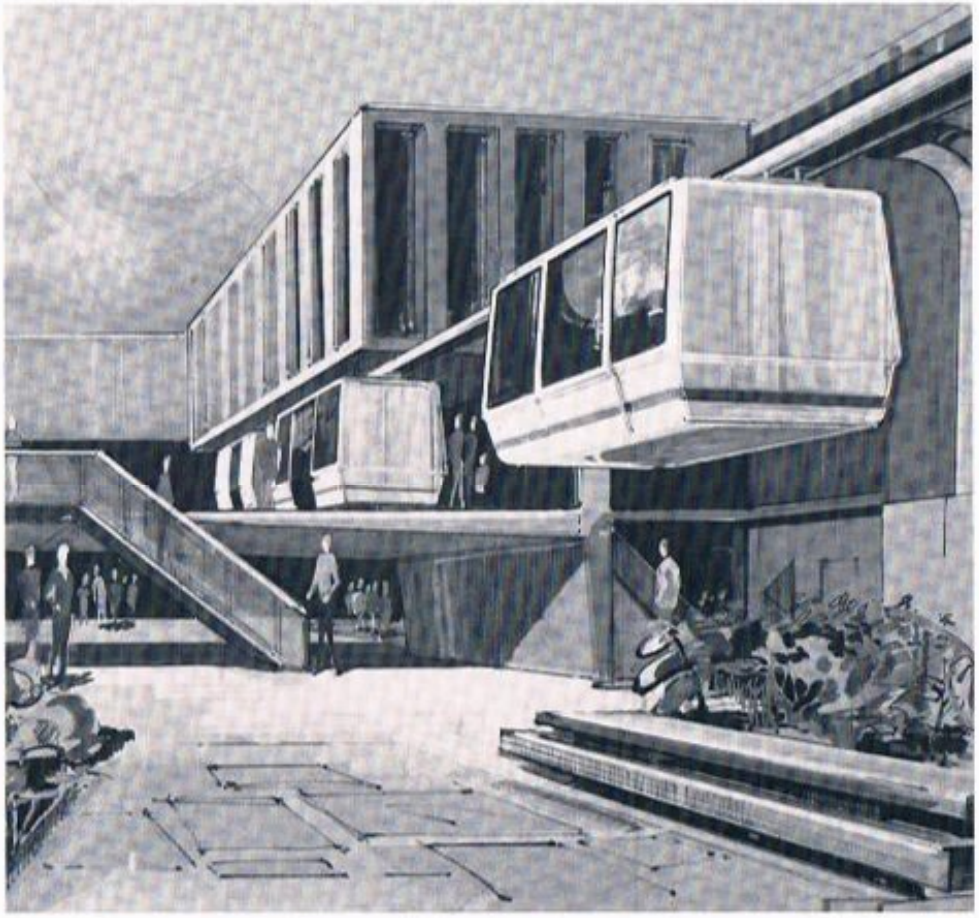
The PRT is at the low speed end of the transportation spectrum, traveling between 10 and 50 miles per hour. These systems are fully automatic, computer-controlled and monitored for fail-safe operation, with smooth, pollution-free electric propulsion. Rohr's industrial design team takes special care to style vehicles that are aesthetically pleasing to the rider and to the community at large. Guideways and other structures are designed to complement the environment in which the Monocab functions.

Already installed at several locations and in the planning stage for many more, PRT systems are gaining acceptance as a desirable method for local transit. Aerospace and computer technology combined with advanced manufacturing methods will assure that the needs for this short-run, high-density mode of transportation are met. Safety, reliability, economy and maintainability are by-words in Rohr's dedication to the pursuit of excellence.



(Upper Left) Monocab stations are designed to blend with the environment, introducing passengers to the system in attractive surroundings. Stations may also be located within existing buildings.
(Lower Left) Monocab systems are controlled by interlocked computers in Central Control. An attendant monitors all operations and provides communications with passengers.

Rohr's Monocab system offers particular advantages where existing street rights-of-way must be used. The guideway and its supports are slender and graceful, providing an unobtrusive appearance without obscuring sun and sky.



MONORAIL TRANSPORTATION SYSTEMS

Rohr Monorail Systems offer a choice of custom-styled vehicles which operate on guideways that may be elevated, at surface level or underground. Top speeds of up to 50 miles per hour with service as often as once a minute, provide passenger capacities between a few thousand per hour to 12,000 or more.

Rohr's Monorail Systems Division has built more systems of this type, including the nation's longest, than any other organization.

Quiet and pollution free, the vehicles ride on rubber tires and are powered by electricity. An aluminum beam guides the vehicles and contains power and control cables.

The systems may be operated automatically, requiring only an attendant at the central computer console for safety monitoring. Other control options, including manual operation with automatic train separation, are available.

Passenger capacity of Rohr Monorail Systems can be expanded by adding vehicles to provide more frequent service or by combining vehicles into trains.

Two basic systems—Monotrain and Railbus—are built by Rohr. Monotrain is a compact "people mover" which provides frequent service with completely automatic operation in airports, shopping malls and similar facilities where stations are close together.

Railbus provides larger cars and higher speeds to move larger numbers of people over greater distances. Four-car trains, each accommodating 200 passengers, can carry 12,000 people per hour with service every minute. Vehicles are attractive and comfortable, yet require a minimum of space for right-of-way, making Railbus a practical choice for many applications in urban areas, parks and zoos, university campuses and other locations.

MONOTRAIN TM

Passengers arriving at Houston Intercontinental Airport by plane are taking Rohr's Monotrain between terminal buildings, parking areas and a new hotel. Six trains, each holding 36 passengers, operate continuously on a 6,000-foot loop linking eight stations. Articulated three-car trains run along each side of an illuminated, air-conditioned concourse, separated from the adjoining pedestrian walkway by a waist-high barrier.

The system is operated by a computer which controls train speed, acceleration, separation and routing, stops trains at stations in alignment with gates, and operates train doors and station gates. An attendant at the computer console provides constant safety monitoring and can adjust system operations.

Vehicles are constructed of molded fiberglass, with insulation between walls, and have comfortable seats and large picture windows.

ROMAG TM MAGNETIC SUSPENSION SYSTEM

RAILBUS TM

A variety of Railbus vehicle configurations and control systems are available from Rohr to meet applications from carrying visitors through protected areas to providing scheduled transit service in urban centers.

Visitors to San Diego Zoo's Wild Animal Park ride a five-mile Railbus system, the nation's longest of its type, viewing one of the world's largest collections of rare animals. Passengers ride in two-car trains which seat 125 and are styled to blend with park's architecture. Trains are operated by park guides with automatic train operation as a safety feature.

For transit service at airports and in urban areas, Railbus provides enclosed, air-conditioned vehicles with large picture windows, ample seating and a choice of control systems including fully-automatic train operation.

A Rohr concept for the future that uses electromagnetic force to both support and propel a vehicle along a track offers exciting possibilities for meeting a broad range of tomorrow's transportation needs. Called ROMAG, the system will power low-speed people movers in dense urban areas, and eventually long-distance vehicles traveling in tubes at supersonic speeds. Another application of the principle is magnetic suspension systems for wheeled rail vehicles. ROMAG is silent, non-polluting, has no moving parts and uses less power than present systems. Unlike other magnetic vehicles, ROMAG uses electromagnetic forces for both support and propulsion, combining simplicity with precise control. A ROMAG test vehicle was successfully operated March 6, 1971, the first time in the United States that a person rode a vehicle supported and moved by magnetism.

ROHR INDUSTRIES...BUILDING BALANCED TRANSPORTATION

A major transportation systems manufacturing company, Rohr has for over 30 years applied aerospace technology to widely diversified disciplines.

In the air, virtually every major multi-engine transport aircraft carries Rohr components including jet engine power plants, thrust reversers, structural assemblies and sound suppression systems.

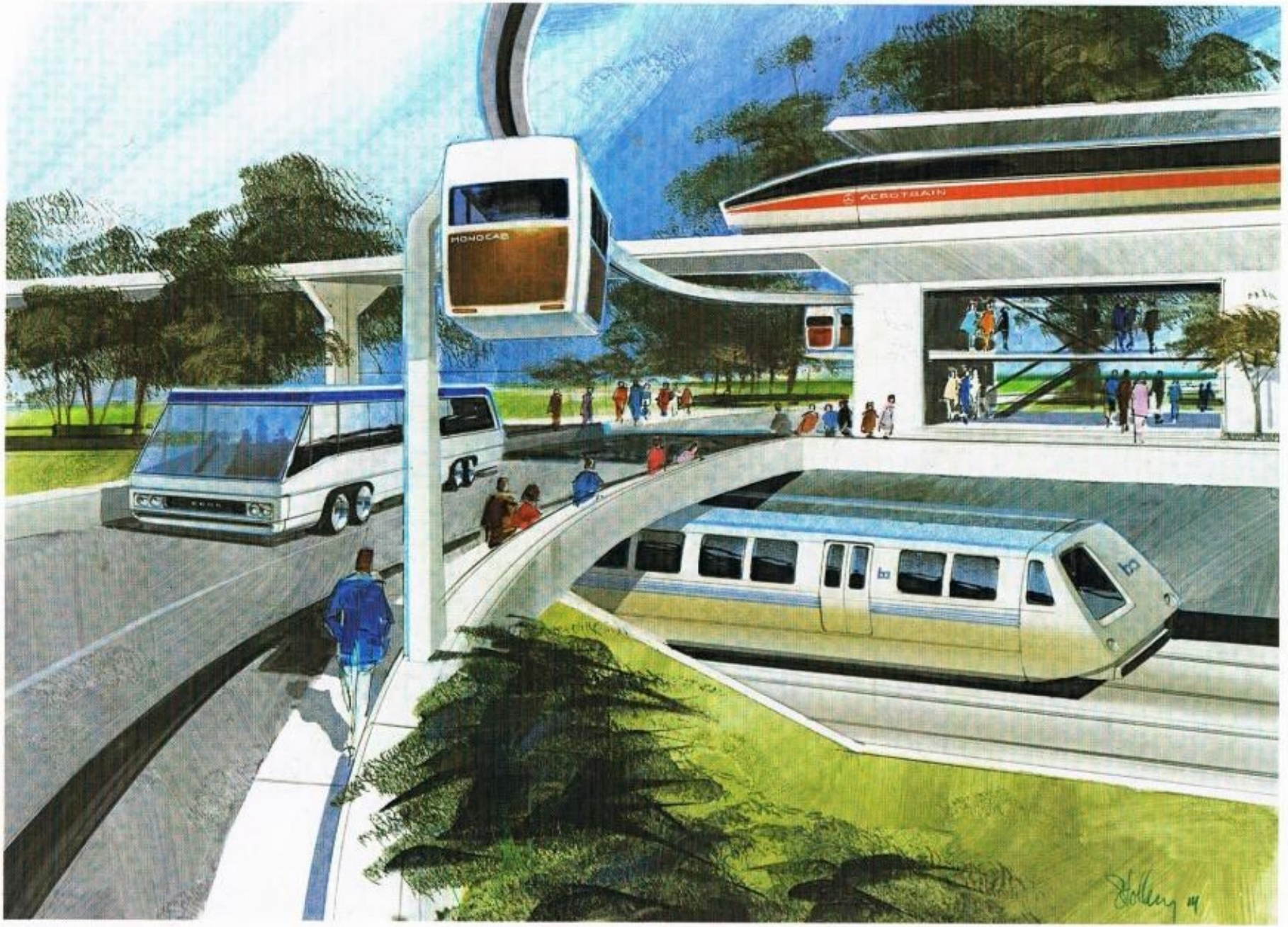
On land, Rohr's contract to build 350 advanced vehicles for San Francisco's Bay Area Rapid Transit District is one of the largest such contracts in the world.

Rohr is a major manufacturer of city transit buses and has under development advanced systems such as tracked air-cushion vehicles and personal transit systems.

Other major products include solid rocket motors, communications antennas, specialized electronics, automated materials handling systems, prestressed concrete structures and computer services.

Main plant and headquarters at Chula Vista, California.

SYSTEMS FOR TOMORROW'S CITIES



ROHR INDUSTRIES, INC.

For additional information about Rohr Industries and its Transportation Systems, contact Dr. John Beck, Vice President, Transportation Systems, Rohr Industries, Inc., Chula Vista, California 92012. (714) 426-7111.

Aerotrain Systems, Inc., Chula Vista, California, Monocab, Inc., Garland, Texas, and The Flxible Company, Loudonville, Ohio are wholly-owned subsidiaries of Rohr Industries, Inc.