

BACK TO THE FUTURE

Lerch Bates is a global leader when it comes to innovation in vertical and horizontal transportation systems. Ingenious, inventive and innovative are just some of the words used to describe Lerch Bates' unique approach to engineering solutions for its clients. These are not just words, says its Chairman Adrian Godwin, but 'real world' solutions to 'real world' problems.

Lerch Bates has always been thinking ahead about the latest technologies and solutions that may benefit its clients. In the US in early 1970s, Charles W. Lerch was writing papers and presenting his "thoughts on the future" about integration of personal rapid transit (PRT) systems within cities and into buildings. With PRT, he argued, service intervals of 30-60 seconds could be provided and this would make a realistic alternative to energy guzzling ground transportation and the huge volumes of car trips. Strangely, we were to return to low energy short range transportation within and between buildings some 40 years later.

An artist's impression (see below) from the February 1974 issue of *Elevator World* describes how a PRT system might link into buildings and their vertical transportation systems. In the same article Charles explained that solar and nuclear sources of electricity could be used and how relatively low rise communities would develop in out of town areas linked to major city centres by larger scale transit systems as well as the broader energy case for continued development of these systems.

At almost the same time in the UK, when computers were three times the size of your living room, Michael Godwin began pioneering work on the first simulation of lift systems ever undertaken in association with the University of Manchester Institute of Science and Technology and its control systems centre.

Even then the idea of 'booking' a lift in the lobby and telling the control system where you wanted to go provided manifold benefits, especially in large buildings that incorporated large groups of lifts. It was around 15 years later, long after the advent of the microprocessor and the PC, that a major proprietary lift company, Schindler Lifts, launched its Miconic X control system, finally delivering such a system to the market place. Even then, Lerch Bates took it a step further by integrating 'lift booking' with security turnstiles. One of the earliest installations Lerch Bates delivered in the UK was the Centre Point building in London's West End.

THE SOUTHWARK LIFT

In the late 1970s, the London Borough of Southwark was facing horrendous problems with the unreliability of the lifts in its housing stock. Typical lifts from suppliers could not cope with the extreme vandalism and abuse that the lifts were being subjected to. The unreliability meant that many tenants returned to their tower block dwellings to find no lift service in the building – and a large number of floors to walk up to get to their front door. Lerch Bates worked with the Council to design a new type of lift that could be built by a large number of manufacturers by using 'independent' equipment sources for all the components.

After visits to New York Housing Authority and a plethora of suppliers who had never supplied product to the lift industry, the 'Southwark' lift was born – the first 14 were installed on the Heygate Estate. Some of the highlights of the new lift design included pushbuttons with 6mm thick stainless steel faceplates that could withstand a hammer blow or a cigarette lighter, and the use of bright textured stainless steel on the lift car, landing doors and within the lift car itself. Bronze bottom track was used to guide the doors which would not corrode if exposed to urine, while a 10mm thick studded rubber flooring with moulded trim sections meant you could throw a bucket of water into the car and clean it out with no detriment to the steel structure.

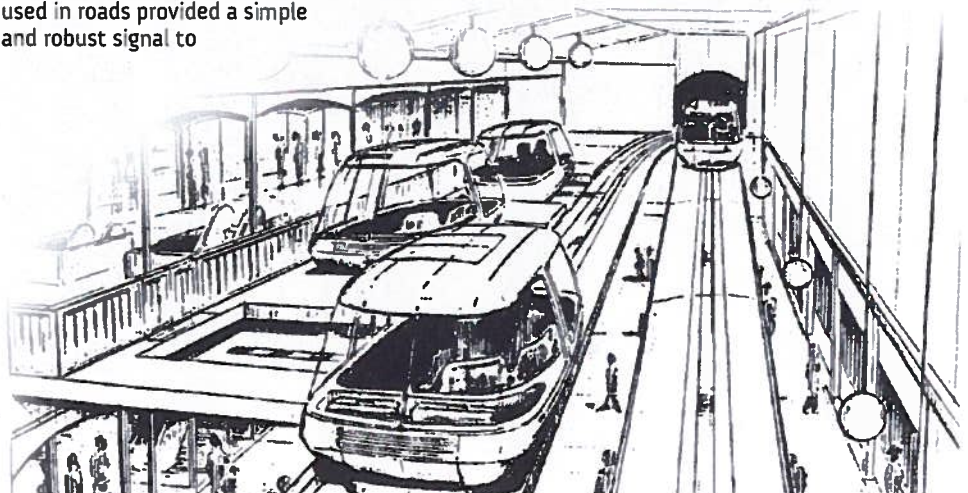
A vandal proof LED indicator sitting behind a glass bead from the Cat's-eye used in roads provided a simple and robust signal to

tenants at every floor served that the lift was operational. This was later upgraded to a position indicator and flashing Lift in Service Indicator (LISI) signal and, for the first time ever, a telephone line was connected to a LISI unit which could dial a central station if and when there was a breakdown. Today this type of lift is commonplace in public housing, car parks and other public transportation facilities.

BUSY BUSH HOUSE

No sooner had this work been completed when the owners and managing agents of Bush House, home of the BBC World Service, approached Lerch Bates in the early 1980s with an altogether different but similarly challenging problem. Because of its 24/7 operation, the 14 lifts used to move staff around four blocks could not withstand the usage. In the Centre Block alone each lift was carrying out more than 2,000 journeys per day – to this day, we have never found a busier group of four lifts!

This high usage level meant that even some of the then best quality manufactured equipment could not withstand the duty being placed on them. Controllers built from hundreds of relays and floor selectors and other electromechanical equipment could not be adequately serviced nor parts replaced fast enough to prevent excessive downtime, resulting in poor lifts service and an unhappy tenant. At that time the lift industry was just making its first forays into microprocessor controls and solid state DC drives. The initial advice to the



BBC was they would just have to wait 3-4 years before all the necessary equipment becomes available that would have a chance of withstanding such heavy duty use. Needless to say the BBC said that waiting that long was not an option and demanded an immediate solution. Furthermore, the BBC started to make additional demands about how they wanted the lifts to operate, including an ETA being given on a digital display as soon as a user registered an up or down call at any floor, priority swipe card for selected users to 'override' normal call assignment and many other features and facilities.

By utilising solid state DC drives and geared winding machines from an American elevator company, Armor Elevator, combined with 'independent' industrial microprocessor control systems with software written by our own engineering team for both the single car and group control, Lerch Bates finally met the BBC's bespoke requirements and delivered a reliable high performance set of lifts that made the building operationally viable.

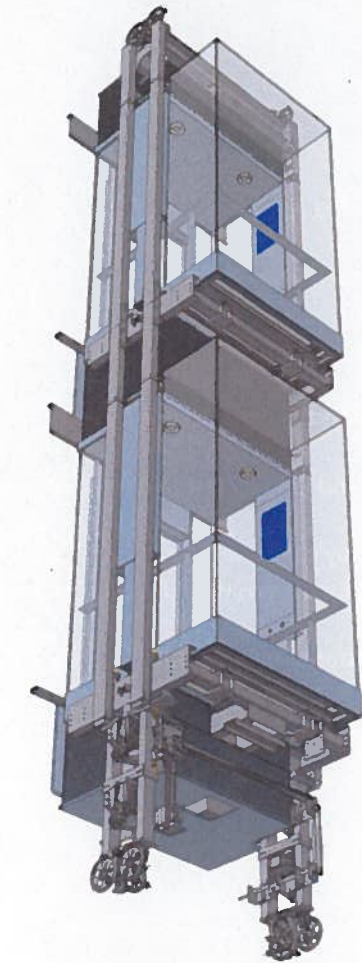
RISING TO THE HIGH-RISE CHALLENGE

During the late 1990s, a number of developers started to make plans for significant high-rise buildings that would change the London skyline, including British Land, Heron Property, and Sellar Property Group. Just like any other high rise development, Lerch Bates' task was to design lift services which would meet all of today's accepted standards for service whilst taking the minimum amount of space in the core to make the buildings viable investments.

Given that it had taken about 15 years for the industry to deliver the first 'destination' hall call control system for single deck lifts, Lerch Bates gambled it could get similar technology for 'double deck' lifts within 10 years. The use of double deck lifts would enable the lifts core to be reduced typically by a third over conventional single deck solutions.

Well, here we are, just over ten years since Lerch Bates started work on these projects and the Broadgate Tower has been completed, the Heron Bishopsgate Tower will be completed in the very near future and the Shard is due to come online next year. All three towers are using the technology we have pioneered and this makes these buildings, from a lift perspective at least, world leaders!

Now Lerch Bates has turned its attention back to having more than two lifts in one shaft and the application of linear motors in



Above: Illustration of a double deck lift.

providing the prime mover for new types of lift cabins that can travel vertically and horizontally, providing a new degree of freedom for building designers and even large scale communities where you are only one lift journey away from home, the office, the shops, the gym or even your favourite restaurant.

Forty years on and we seem to be finally bringing together the pieces of the jigsaw necessary to make those 'green' communities and PRT around developments postulated by Charles Lerch all those years ago a practical commercial proposition. The innovative approach of Lerch Bates to solving problems on a client or wider community basis is very much alive and we look forward to cooperating with manufacturers and others to realise these important steps in bringing a new dimension to short range passenger transportation systems of the future.

Fast forward to the future

close up

Lerch Bates' 'skytrak' family of solutions, which has been made possible by replacing Elisha Otis' safety gear with a track containing permanent

magnets and a 'tuned' stator winding mounted on the cabin to provide the same inherent safety, includes the following potential passenger carrying solutions

Synchorail

A very low cost PRT system with no 'on board' drive but a simple permanent magnet assembly driven by a fixed small section stator located on the track. Apart from 'on board' batteries for lighting, air-conditioning and communications there are no other costly components.

Synchroglide

A revolutionary ultra low cost PRT system using gravity. Cabins are lifted at the terminal stations using conventional lifts before passengers board and the capsules released to travel at constant speed down the rope/track arrangement. Again, apart from 'on board' batteries for lighting, air-conditioning and communications, there are no other costly components. There is a small amount of mechanical handling at the stations as cabins are pushed into and out of lifts and positioned for automatic station doors to operate, allowing passengers safe access and egress.

Egress

A personal raid escape device for life threatening emergencies in buildings where safe stair evacuation has been negated. Building occupants take a lifejacket and proceed to the track locations both within and on the perimeter of the building. Occupants descend at slow constant speed to an aircraft type chute at the base for safe escape.

Skytrak

A new type of rotating cabin capable of negotiating curves and complete circular movement around a building. Arranged as a complete circular path the track can contain many cabins and offer high handling capacity and excellent 'quality' of service for users.

Vertrans

A purely vertical application of the Skytrak family of products enabling multiple cabins to travel 'up' in one shaft and then be transferred to an adjacent 'down' shaft by using a simple switch. Increasing the number of cars travelling in one shaft reduces the number of lift shafts needed in a large building by around 60% giving developers a huge amount of additional lettable or saleable floor space.