

# Association of Professional Engineers

of the

Province of Manitoba

## Certificate of Engineering Achievement

presented to

**NEW FLYER INDUSTRIES LIMITED**

for the design and development of

**THE LOW-FLOOR TRANSIT BUS**

*The Certificate of Engineering Achievement is awarded to New Flyer Industries Limited for the design and development of the Low-Floor Transit Bus.*

*Its innovative product design allows for the utmost convenience to the transit user with a continuous floor at 14" above ground from the entrance door to the exit door. It also incorporates a simple wheelchair ramp and tie-down locations allowing full accessibility to handicapped persons.*

*New Flyer's introduction of the Low-Floor coach make it the first of its kind in North America. European manufacturers had developed similar technologies in the last decade due to public demand. The necessity for low-floor coaches arises from the need to provide accessibility for elderly and handicapped persons. In addition, the "Americans With Disabilities" Act dictates that all transit coaches sold within the United States have accommodations for access by and restraint of wheelchair occupants. Following suit, Canadian transit authorities are now writing similar requirements in their specifications. On the Low-Floor coach, the entrance and exit ways do not have steps that would normally hinder people with limited mobility. The addition of a ramp mechanism allows full access without the need of an expensive and complex wheelchair lift.*

*Design of the New Flyer Low-Floor transit coach required several innovations and departures from conventional transit coach designs. The design was completed from the ground up including drive-train, suspension, structure and auxiliary equipment. Because many of the industries standard components were not suitable for this application, alternatives were developed in-house.*

*Upon completion of the initial structural design, finite element analysis was performed to determine local high-stress areas prior to building the first prototype vehicle. Structural testing for the Low-Floor coach consisted of fatigue and durability evaluations. The fatigue evaluation was performed by strain-gauging known high-stress areas and through road tests on several operating routes in North America. The projected fatigue life of the coach structure easily exceeded the design criteria for coach life of 500,000 miles. The durability testing required by the Urban Mass Transit Association (UMTA) in the United States involves a condensed durability test cycle. This is performed on the Altoona, Pennsylvania test track. While most coaches rarely complete one cycle (12,000 miles) on the durability track, the New Flyer Low-Floor prototype has successfully completed three cycles with different drive-train and air conditioning combinations.*

*The New Flyer Low-Floor coach was subjected to complete vehicle evaluation for compliance with both U.S. Federal Motor Vehicle Safety Standards (FMVSS) and Canadian Motor Vehicle Safety Standards (CMVSS). These tests included braking performance, roof crush test, and side impact test.*

*New Flyer is the only North American bus manufacturer to date with a production Low-Floor coach and has delivered over 300 of them. With orders for an additional 500 coaches throughout North America the Low-Floor transit bus is definitely gaining acceptance as the product of the future.*

*This considerable engineering achievement resulted in the most user-friendly transit coach available today.*

March 7, 1995