

# ETS Light Rail Transit



## History

Edmonton was the first city in North America with a population of under 1 million to build a modern Light Rail Transit (LRT) system.

The first leg of the LRT opened in 1978 for the Commonwealth Games. A number of expansions followed. LRT now travels 12.3 km from the northeast part of the city, tunneling under Jasper Avenue downtown and linking across the North Saskatchewan River to the University of Alberta campus.

The downtown stations provide a direct link to the downtown pedway system, connecting with many major buildings, cultural facilities and shopping centres for year-round comfort. LRT connects with two major sporting venues -- Commonwealth Stadium and Skyreach Centre.

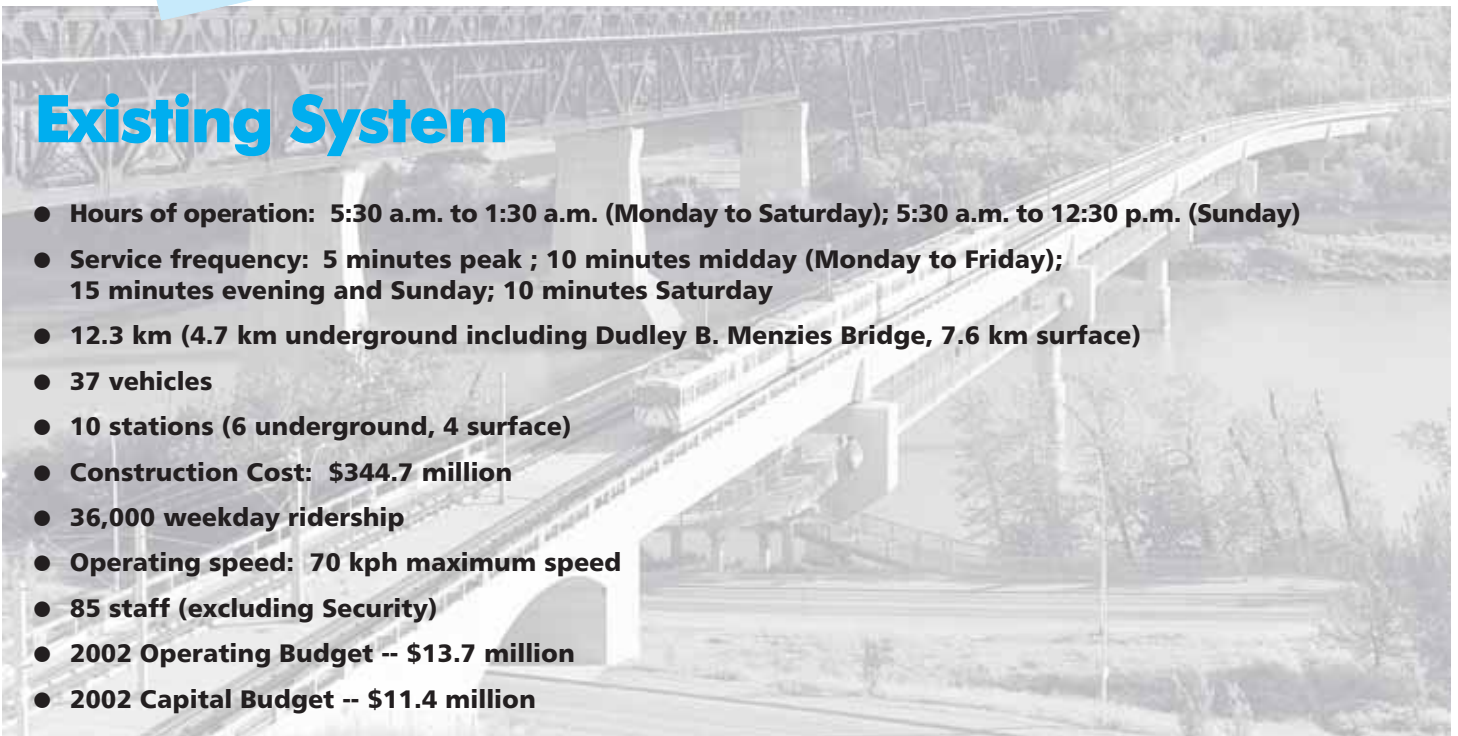
Edmontonians and visitors have taken the LRT to most of Edmonton's major events over the past 20 years starting with the Commonwealth Games in 1978. Edmonton has hosted the World University Games, major concerts, sporting events ranging from the Stanley Cup to the World Figure Skating Championships, and countless festivals.

## Benefits

- **Fast**
- **Efficient**
- **Clean**
- **Saves energy**
- **Low operating cost**
- **Reduces roadway congestion**
- **Reduces need for road construction**
- **Quick and easy transfers with buses**
- **Direct access to Park & Ride facilities**

## Existing System

- **Hours of operation: 5:30 a.m. to 1:30 a.m. (Monday to Saturday); 5:30 a.m. to 12:30 p.m. (Sunday)**
- **Service frequency: 5 minutes peak ; 10 minutes midday (Monday to Friday); 15 minutes evening and Sunday; 10 minutes Saturday**
- **12.3 km (4.7 km underground including Dudley B. Menzies Bridge, 7.6 km surface)**
- **37 vehicles**
- **10 stations (6 underground, 4 surface)**
- **Construction Cost: \$344.7 million**
- **36,000 weekday ridership**
- **Operating speed: 70 kph maximum speed**
- **85 staff (excluding Security)**
- **2002 Operating Budget -- \$13.7 million**
- **2002 Capital Budget -- \$11.4 million**



# The Line

LRT in Edmonton is a successful blend of surface and underground stations. The line extends from the northeast residential area of Clareview on the surface, sharing the CN Rail right-of-way until it nears downtown. At 95 Street it enters its own tunnel, beginning the underground portion of the line which extends through the downtown area to the North Saskatchewan river valley. It crosses the river on its own bridge, just west of the High Level Bridge, and enters a second tunnel to the University of Alberta.



*Belvedere Station*

# Bus/LRT Connection

LRT is an integral part of the Edmonton Transit System. LRT Route 201 is treated as a main line route in the transit network. The regular fare, monthly passes and tickets, with free transfers between routes, all apply to LRT. Bus and LRT schedules are carefully designed for quick and easy transfers. The LRT gives fast, direct service to its riders through convenient links to the fleet of buses and direct access to park and ride facilities. LRT customers have free parking at Clareview, Belvedere and Stadium stations.

# The Stations

The LRT stations have been designed to blend into the surrounding communities. As a result, each of the stations has design and colour features which makes it unique. Surface stations -- Clareview, Belvedere, Coliseum and Stadium -- have covered, heated waiting areas at

track level. Two of these stations are located at major public sports and entertainment facilities - Skyreach Centre and Commonwealth Stadium. Underground stations -- Churchill, Central, Bay, Corona, Grandin (Gov't Centre) and University -- have both mezzanine and platform levels. The Proof of Payment area begins at the access points to the train platform. All stations have stair, escalator and elevator access to the platforms. Wheelchair access to the trains is available via the elevators.



*Grandin Station*

# Art in the LRT

ETS is building a collection of art in LRT stations as part of our commitment to promoting the LRT as both a people mover and a people friendly space. We currently have wall murals in Churchill, Central, Grandin and Coliseum stations. There is a large sculpture inside Churchill Station and a series of flag sculptures at the entry to Stadium Station. Stained glass in Belvedere Station and gel/plexiglass panels in Clareview Station are the newest additions to our collection.

# LRT Construction

Construction of Edmonton's LRT system contained a number of 'firsts'. Tunneling firsts include the first use of the hydroshield tunnel boring machine in North America and the first time the sequential excavation method of tunneling in soft ground was used in North America. The Dudley B. Menzies Bridge across the North Saskatchewan River was the first construction of a segmental post-tensioned bridge in Western Canada. At the time of construction, this bridge contained the longest spans for a segmental post-tensioned bridge in North America. The LRT system has received recognition for excellence for a number of features. The City of Edmonton Architectural Award (1978) was presented to Bittorf-Holland-Christianson Architects Ltd. and John A. MacDonald Architect Ltd in recognition for the Stadium Light Rail Transit Station project. The 1980 Achievement Award by the Association of Professional Engineers, Geologists and Geophysicists of Alberta (APEGGA) was awarded in recognition of considerable engineering skill and substantial contribution to technological progress and the betterment of mankind. The Dudley B. Menzies Bridge won an American Concrete Institute Award. Belvedere Station won two awards, the Masonry Contractors Association of Alberta Award of Excellence and the Canadian Institute of Steel Construction, Alberta Steel Design Award in the Architectural Category for Most Effective and Innovative Use of Structural Steel.



*Hydroshield Tunnel Boring Machine*





LRT with new colors

## Construction History

### First segment opened on April 22, 1978

- 6.9 km of track
- 14 LRV's
- 5 stations (Central to Belvedere)
- \$64.9 million

### Clareview Extension opened in April 1981

- 2.2 km of track
- 3 LRV's
- 1 station
- 450 capacity parking lot
- \$9.5 million

### Downtown Extension to Corona opened in June 1983

- 0.8 km of track
- 20 LRV's
- 2 stations (Bay, Corona)
- \$89.6 million

### D. L. MacDonald Transit Yard opened in December 1983

- \$28.2 million

### Grandin Extension opened in September 1989

- 0.8 km of track
- 1 station
- \$67.1 million

### University Extension opened August 23, 1992

- 1.6 km of track (double track to South Portal, then single track to University)
- 1 station
- 1 bridge (Dudley B. Menzies)
- \$79.1 million
- second track from South Portal to University opened May 14, 1994

### Belvedere LRT Station upgrade opened September 23, 1998

- covered station
- 5 car platform
- grade separated pedestrian overpass
- \$6.3 million

### Clareview LRT Station Upgrade opened March 4, 2001

- covered platform for 5 car trains
- bus transit centre on each side of the tracks
- pedestrian underpass connecting both new bus transit centres
- approximately 1500 parking spaces
- \$11.5 million

## LRT Vehicle

Edmonton's light rail cars are manufactured by Siemens/Duewag. Although it is German-built, 35% of the vehicle components were manufactured in Edmonton.

Each car is about 24.3 m long and 2.65 m wide, and has a flexible, joined (articulated) section in the middle to allow for sharp cornering. Each car can carry approximately 161 passengers comfortably (64 seated, 97 standing).

Doors open individually by a passenger push-button which is first released by the operator. Sensitive edges and a photo-electric cell ensure the doors do not trap riders.

The vehicles are heated in winter and force ventilated in summer. Heated sanders automatically drop sand if the wheels begin to slip or slide.

LRT vehicles operate as a single car or in trains of up to four cars.

They can easily be coupled or uncoupled to adapt to passenger volumes. Edmonton has a total of 37 cars. The average operating speed is 32 kph. The maximum design speed of the car is 80 km/hr, with a nominal operating speed of 70 km/hr. 600 volt DC power is drawn from an overhead catenary system via a pantograph mounted on the roof of each vehicle. The electricity is fed from substations located along the LRT line.

## Travel Information

Route and schedule information, and instructions on using the LRT are available on both the mezzanine and platform levels of all stations. Each station has two unique BusLink numbers -- one number for northbound trains and one number for southbound trains.

Ticket sales and validations are done by machines. There are no staffed fare booths on the LRT system.

The main ETS Customer Services Centre is located on the mezzanine of Churchill Station. It provides route brochures and individual trip planning, sells ETS fare products, and houses the Lost and Found office.



Churchill Station

## LRT Wayfinding Signs

The wayfinding signs in the LRT system have been designed to provide consistency in the visual elements of placement, colour and font; promote legibility and readability; and provide a functional, contemporary wayfinding system.

The font/typeface was chosen to make the text easier to read from a distance. The pictograms used are designed so they are easy to understand. The signs are colour coded with information grouped by importance. Strong contrasting colours were chosen to make the signs easy to spot in the stations.

## Safety and Security

Blue Emergency Help Phones are located in all LRT stations. These push button phones connect directly to the transit control centre and are monitored by CCTV cameras.

Direct Access Pay Phones are located in the proof of payment areas. They provide coin free calling buttons that allow for a push button access to 911, 611, 411, 0 and ETS Security.

CCTV (closed circuit television) monitors the LRT system and City-owned pedways. The system enables transit staff to constantly monitor and record, if required, activity in the LRT system.

The ETS Control Centre in Churchill LRT Station, contains LRT operations, bus operations and ETS security.

Touch Strip Passenger Emergency Alarms are installed in all LRT vehicles. Touching the strip activates a two way communication system with the train motorman.

Red Emergency Alarm Handles are located at alternate doors in LRT cars. Pulling the handle sends a 'passenger emergency' signal to the train motorman and activates a two way communication system.

Uniformed Transit Security Officers patrol the entire LRT system during operating hours. They open the stations to the public in the morning and lock the stations every night.

## Accessible Features

The LRT system is accessible for customers who have mobility difficulties. Features include:

- elevator, escalator or ramp access to all levels
- warning strips and zone lighting at platform edges
- automatic doors at most handicapped accessible entrances
- hands-free emergency phones directly linked to LRT Security in all public areas
- hands-free information phones in all stations directly linked to Customer Service
- infrared sensors at elevator doors to prevent doors from closing against a person or object
- payphones with variable volume control
- low height payphones for persons using wheelchairs
- handicapped washrooms at Clareview, Belvedere, Churchill and Central stations
- handicapped parking at Clareview, Belvedere and Stadium stations.

All LRT cars have accessible ramps to improve customer access for those using wheelchairs and other mobility aids.

## Future Plans

The South LRT Extension Project is currently underway. This construction phase will bring the LRT to the surface at the new Health Sciences Station on 114 Street south of 87 Avenue. This project is expected to be complete in 2005.



# ETS

Edmonton Transit System

Owned and Operated by The City of Edmonton