Edmonton's LRT

presented by: Wayne Mandryk, P.Eng.
Manager, LRT Design and Construction
Capital Construction Department

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THE CITY OF Edmonton

Overview

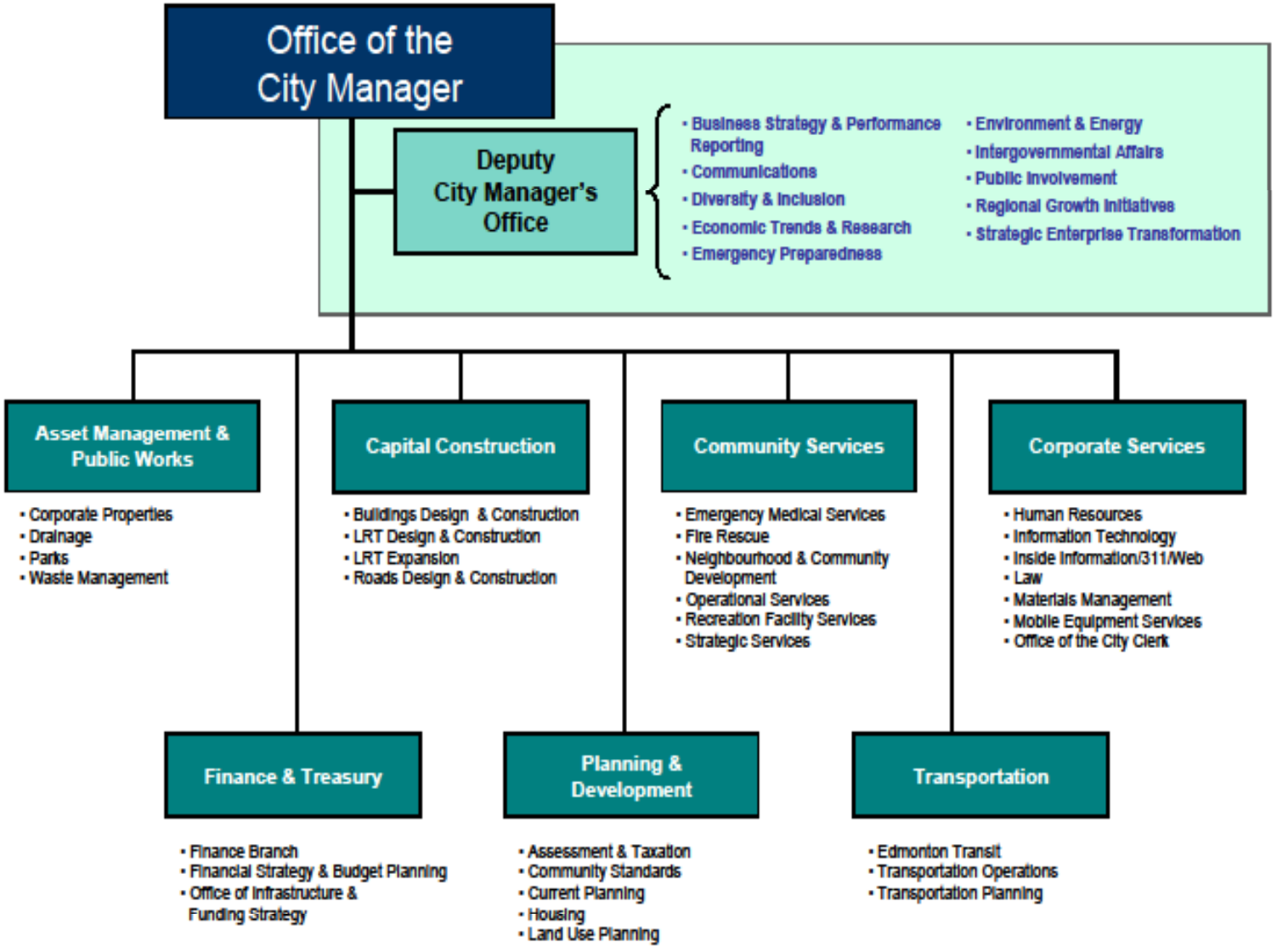
- Edmonton and the Transit System (ETS)
- Light Rail Transit System Development
- Future Plans
- Key Choices
- Lessons Learned

City of Edmonton Comparison

	Edmonton	Ottawa
Population		
Total	1,094,105	888,882
Urban	766,742	778,207
Employment		
Total	546,737	544,900
Urban	428,890	495,000
Area (sq km)		
Total	9,532	2,796
Urban	700	413

Edmonton Region

City of Edmonton (Administration)



Edmonton Transit System (ETS)

- Operates bus, LRT and paratransit services
- 2100 employees
- 874 buses
  - > 83,000,000 annual boardings (280,000 / weekday)
- 74 LRT cars
  - > 16,000,000 annual boardings (54,000 / weekday)
- Paratransit service (DATS)
  - > 920,000 annual passengers (3,500 / weekday)

Edmonton LRT: 1978 to 1992

LRT construction was initiated in the mid-1970s. Over the next 20 years the system developed from Clareview Station to University Station. When University Station opened in 1992, the system included:

- 12.3 km of tracks
- 37 LRV cars
- 10 stations
- 36,000 weekday riders
- 2500 park 'n ride stalls
- Capital investment $600 M

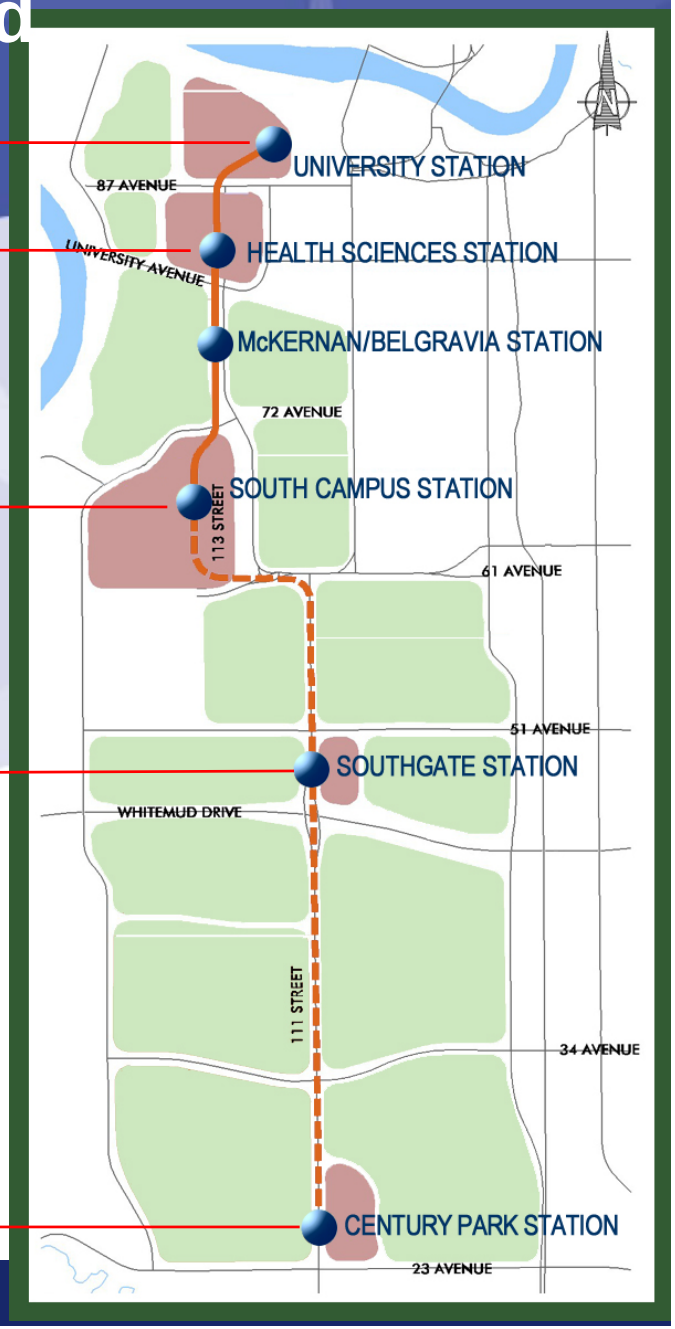
South LRT: out from underground

Section 1A Opened January 2006

Section 1B Opened April 2009

Section 2 Opening April 2010

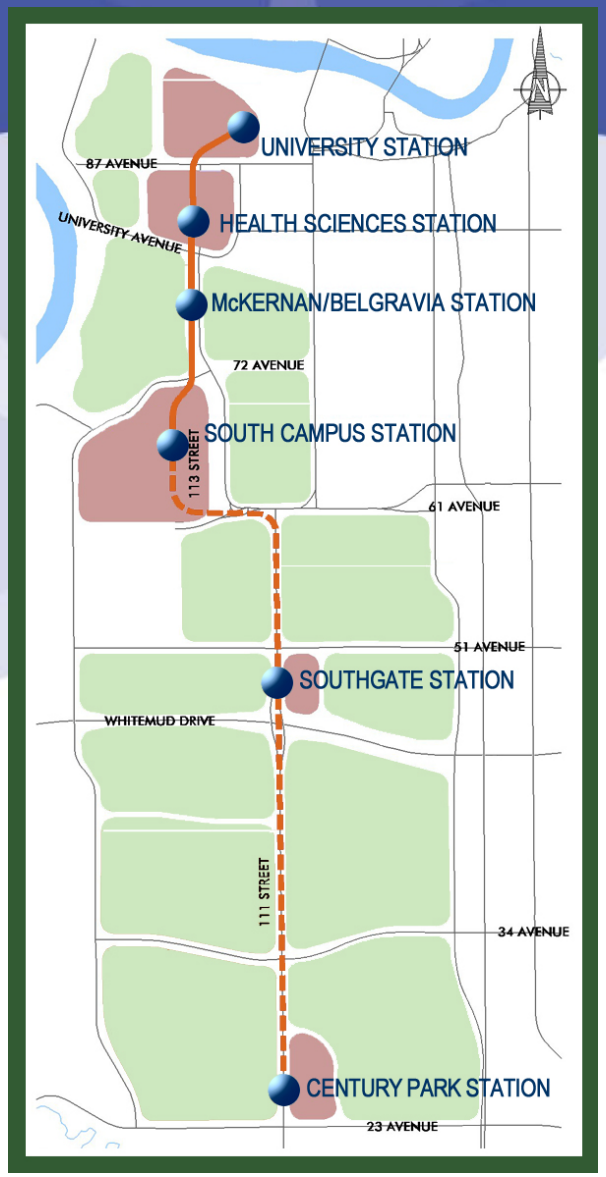
Section 3 Opening April 2010



Budget – South Expansion

Health Sciences to Century Park

Health Sciences to Century Park	$573 M
26 LRV cars	$100 M
Total	**$673 M**



North to NAIT

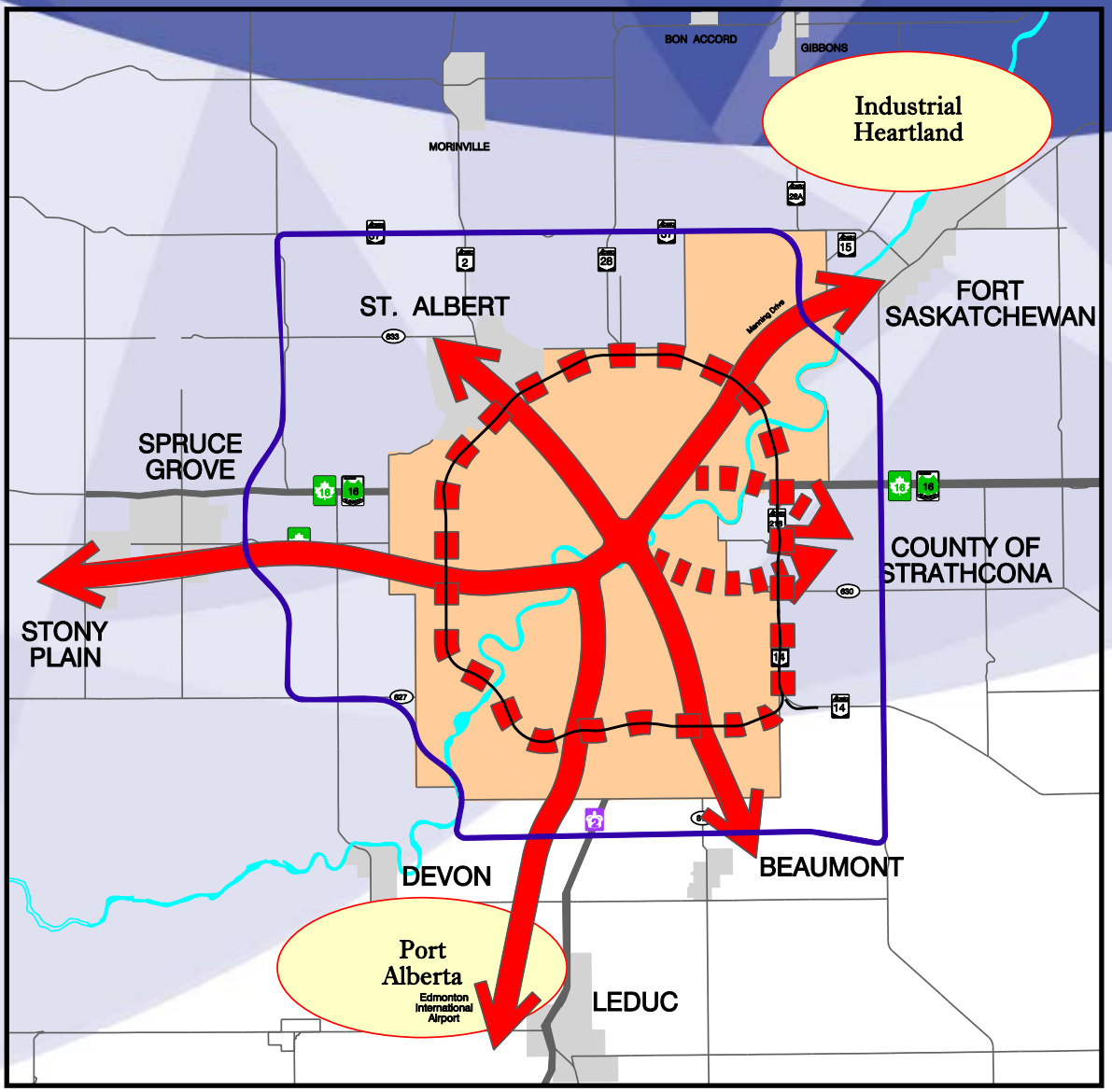
Next Extension

-Concept Plan approved by City Council in September 2008

-Preliminary Engineering design to be completed by July, 2009

-Construction budget approval subject to provincial funding under “Green Trip” program

The future of LRT in Edmonton



Potential LRT Connections

THE CITY OF Edmonton

Edmonton's LRT Fleet

100% Siemens cars

- Based on Frankfurt, Germany design

U2 cars – assembled in Edmonton

- 1978 (14), 1981 (3), 1983 (20)

SD160 cars – Sacramento, California

- 2009 (37)

Total fleet – 74 cars

Siemens U2 LRV

Siemens SD160 LRV

Siemens SD160 Light Rail Vehicle

- Single articulated high floor vehicles
- 60 seats
- Passenger capacity – max. design 190, max experience 160, service design 128
- Bi-directional operation
- 5-car train operation capability
- Fully ADA compliant
- Air conditioned

Siemens SD160 Light Rail Vehicle

- Catenary supply voltage – 600 Vdc
- 3 trucks (2 powered)
- Four 145 kW AC microprocessor-controlled traction motors
- Maximum speed 80 km/hr
- Maximum operating gradient 7%

Edmonton's LRT Right-of-Way

Exclusive (tunnel) & semi-exclusive right-of-way with train priority at all grade crossings.

- Supports higher speed, thus high capacity
- Require policy direction on maintaining road design and intersection capacity if road ROW is required
- Pedestrian crossing protection varies depending on operating conditions (ref . TCRP Report 69)

Summary Table
Minimum and Preferred ROW Widths for a Sample of Typical LRT Mainline Level Tangent Trackway Cross Section Configurations

Typical Trackway Cross Section	Minimum ROW (mm)	Preferred ROW (mm)
1 TRACKWAY OPEN AREA		
1A Basic Trackway with Ditches (refer to Figure 3.7)	18,215	19,715
1B Basic Trackway with Subdrains (refer to Figure 3.7)	11,500	12,500
1C Basic Curbed Trackway (refer to Figure 3.8)	12,700	19,700
1D Trackway at Crossover with Subdrains		
i) With switch blowers on one side	13,025	
ii) With service vehicle layby on switch blower side	15,500	
iii) Provide 1000 mm offset to ROW limit for 1Dii)		16,000
1E Trackway Configuration 1C with MUT on one side	17,100	18,100
1F Type 3 Station with 9 m Platform and Curbed Trackway Longitudinal distance required to transition ROW to basic trackway width is (50+100+20+50 = 220 m)	20,310	21,610
1G Trackway Configuration 1B at Pocket Track	22,810	23,810
2 TRACKWAY BESIDE ARTERIAL OR COLLECTOR ROAD		
2A Basic Trackway with Subdrains	12,000	15,800
2B Basic Trackway with Subdrains at Track Crossover	13,025	15,800
2C Basic Curbed Trackway	12,050	16,050
2D Basic Curbed Trackway at Track Crossover	12,275	15,050

Edmonton's LRT Service Capacity

Current capacity:

- 42 cars @ 5 min peak freq – (6 trains x 4 cars + 6 trains x 3 cars)
- Approx 5400 pph

AM peak hour boardings (Sept. 2008)

- 5260 Maximum line capacity:
- 5 min frequency with 5 car trains
- approx 7700 pph

Edmonton's LRT Service Capacity

Capacity Limitations

- Station platform length – 123 metres (5 cars)
- Signal system (fixed block)
- Power system – currently 4 car train maximum
- Average operating speed 00km

Long-term Potential LRT Ridership

Northeast: 70,000 to 80,000

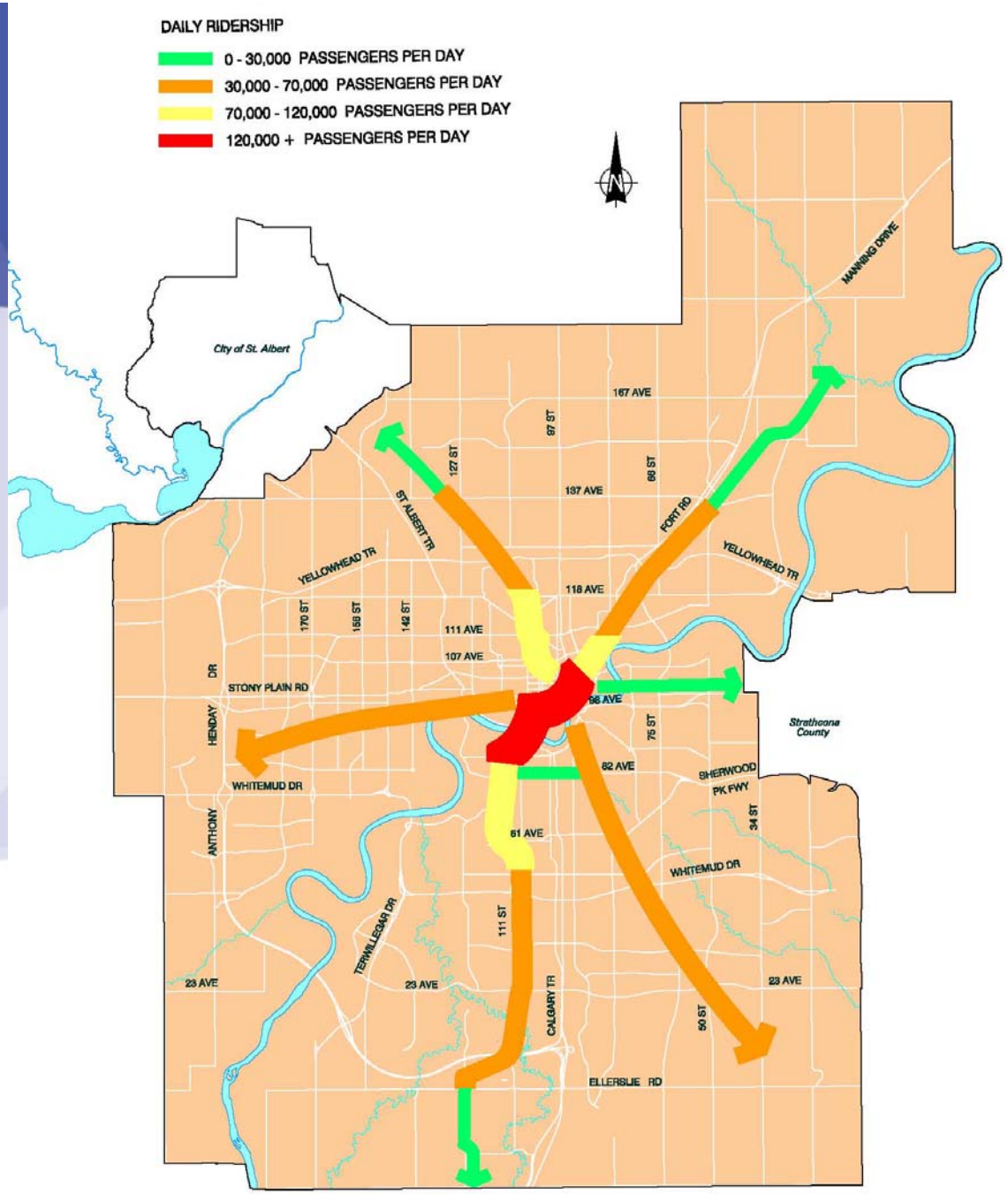
Northwest: 70,000 to 80,000

South: 90,000 to 100,000

Southeast: 45,000 to 50,000

West: 45,000 to 50,000

East: 20,000 to 30,000



Technology Choices – Why?

Common 1978 Technology

- high floor cars
- fixed block signal systems
- 600 volt power supply

Available Technology Today

- low floor cars
- moving block, in cab, wayside communication
- 750 volt power supply

But It's More Than Technology!

In 1978:

> Means to economically move large volumes of people quickly between major destinations.

> Suburban system: high average speed, 1–2.5 km between stations, major transfer stations with bus system.

Today:

> Linked to transit oriented Land use policies

> Support development

> Move to more urban system integrated into communities – lower speed, more frequent stops, community stations

➢ Be part of an integrated regional network

Policy Framework / System Objectives

The system is changing

- Transit priority / Maintain road capacity
- Station locations
- Integration with bus system
- Park and Ride strategy

Result – hybrid mix of community and large transfer stations, varying operating speeds

McKernan/Belgravia Station

Southgate Station Construction (October '08)

D.L. MacDonald Maintenance Facility

Some Final Thoughts

-Low Floor

-Higher voltage

-In cab signal system

-Plan for future demand/capacity (i.e. expanding platforms, frequency, train lengths, operating speed)

-Plan for possible future stations

-Plan for future connections (turnouts, tunnel breakouts)

Thank You!