

# Transit ITS in York Region

*CUTA Presentation – Nov. 11, 2004*



**YORK REGION RAPID TRANSIT PLAN**



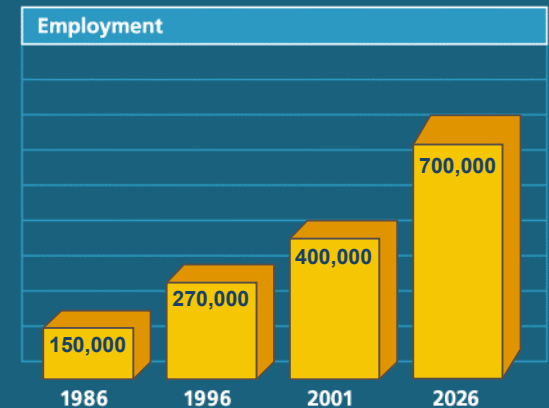
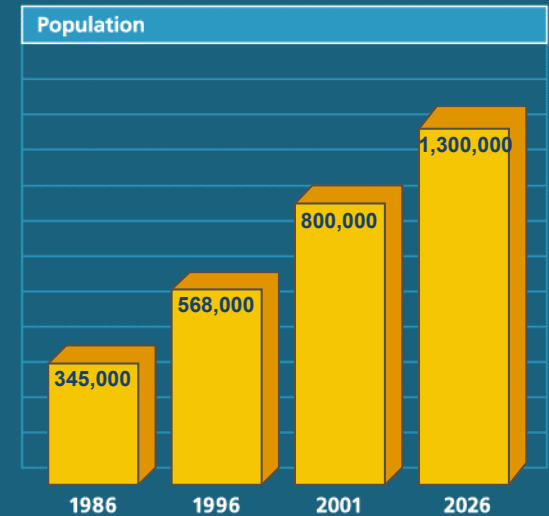
# The Problem: Rapid Growth

## POPULATION

- Over 830,000 – projected to reach 1.3 million by 2026
- Currently growing by 40,000 residents a year

## EMPLOYMENT

- Approximately 400,000 (same as Toronto CBD)
- Projected to reach 700,000 by 2026



# Traffic Gridlock

## AUTOMOBILE DEPENDENCY

- Over 50% of households have 2 or more cars

## CHANGING TRAVEL PATTERNS

- For every 100 trips heading south, 80 trips head north
- Intra-regional travel is also growing significantly

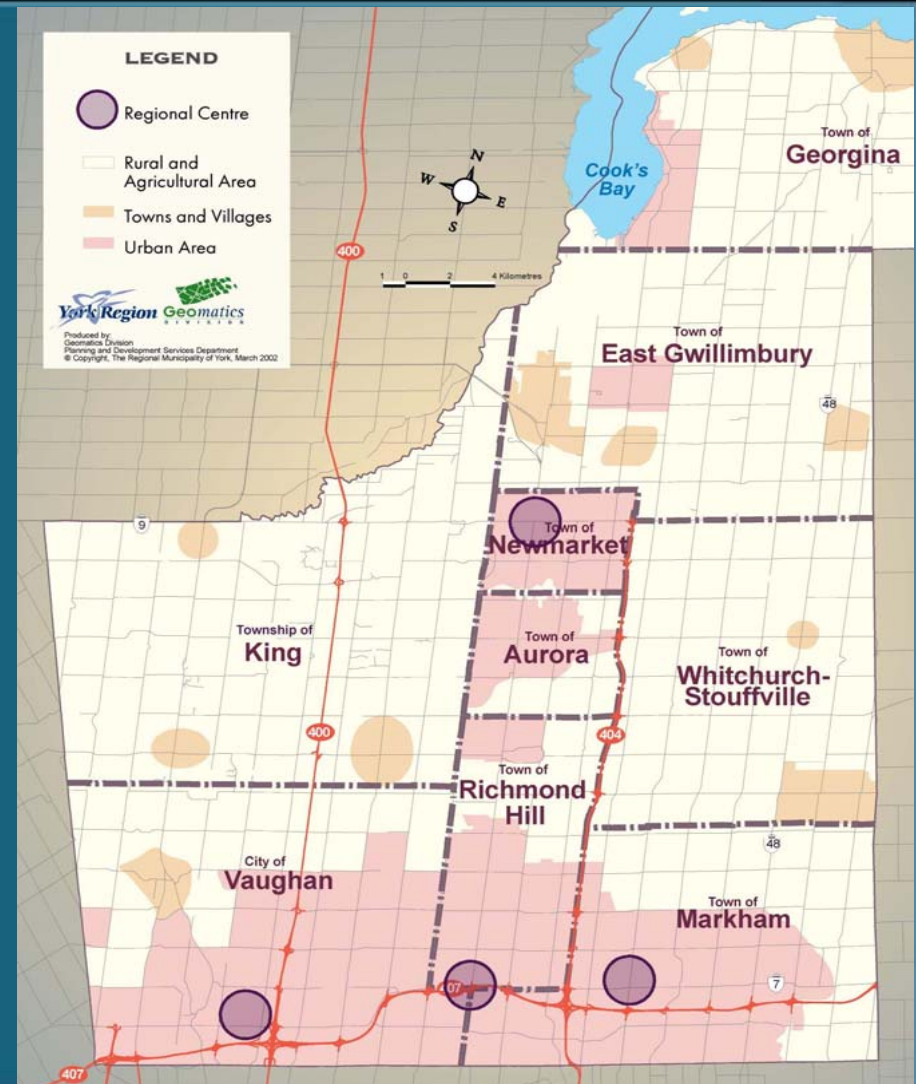


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# The Solution ...

- Double ridership on public transit by building a rapid transit network
- Accommodate growth in compact, mixed-use urban centres
- Give transit priority to improve speed and reliability on the roads using ITS technology



# Start of Service

- Schedule information loaded through the wireless LAN in the garage area
- Info supplied from the scheduling software
- Including data on likely delays caused by construction
- Information can be updated during the day if necessary



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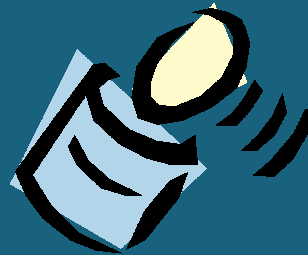
# On the Road

- On-Board system supports both text & voice communication with the driver
- Infrared Automatic Passenger Counting at each stop (tied to GPS to give counts by stop)
- Computer logs the information for future analysis



# On the Road

- GPS determines bus position
- Tracks it against the scheduled position
- Sends positional info to the Control Centre
- Time/distance/speed data is logged on-board for later use



# On-Board Functions

- Data terminal
- Automatic stop announcements (audio & visual)
- Driver PA system
- Emergency switch/covert microphone to protect driver
- Automatic passenger counter



# Transit Control Centre

- Calculates time to arrival at next stop
- Sends message to the changeable message sign at the stop



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# At the Stop

- Changeable message sign gives next arrival information
- Off-board fare collection is provided via an automated Ticket Vending Machine
- Shelter is provided
- Distinctive design identifies the stop as part of the overall service



# Fare Vending Machines

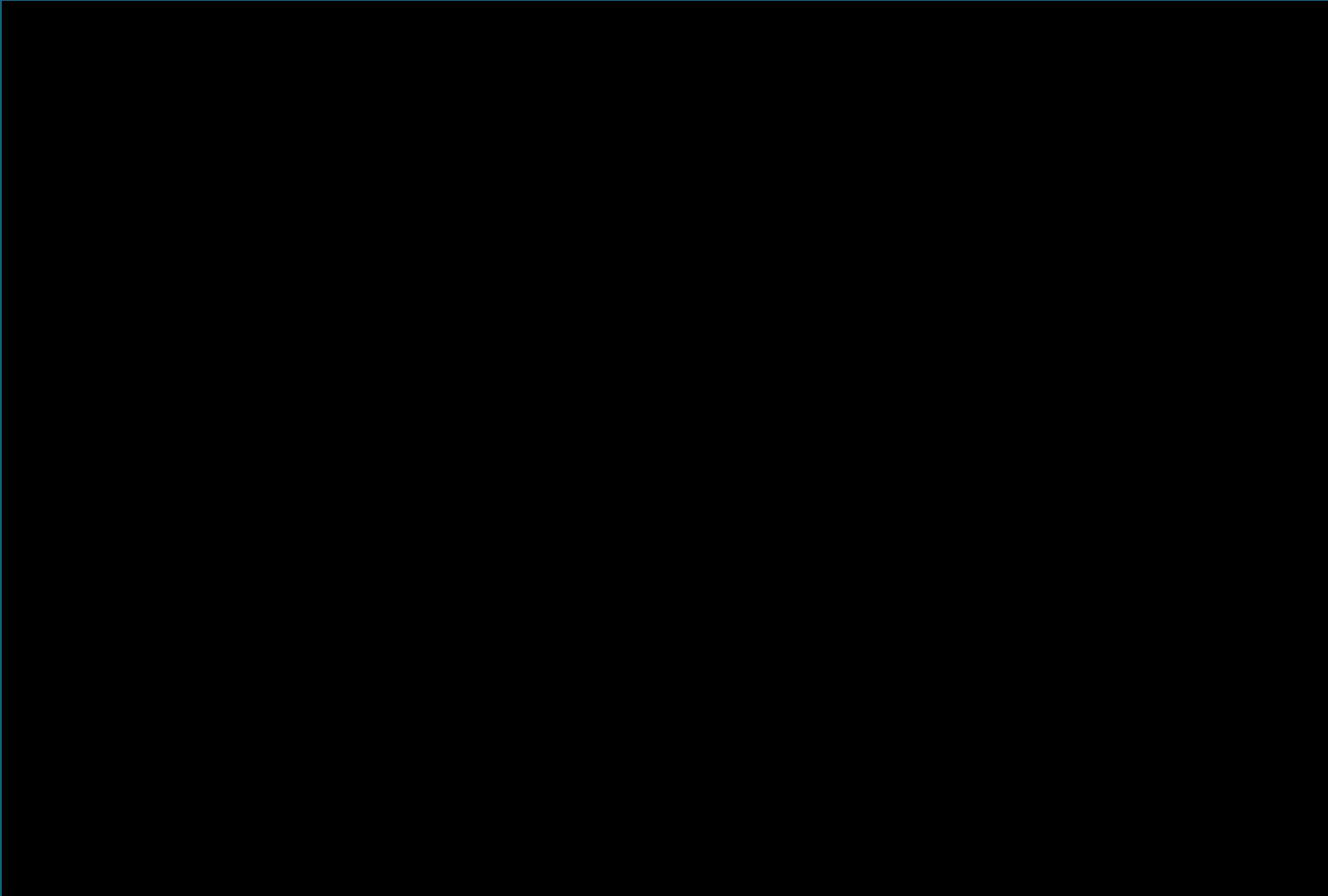
- Tied to Control Centre via phone line
- Machine notifies the Control Centre when it is not operating
- Message can be relayed to drivers (who will then be prepared for passengers without validated fares)
- Crew is dispatched to fix the machine



# Activating Signal Priority

- Priority can only be requested when the bus is behind schedule
- Opticon system is used to trigger signals
- Request is checked and appropriate signal plan activated
- Red truncated or green extended





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# Requests Logged by Traffic Control

- All requests are logged
- System can limit number of preemptions by signal in any given hour
- Can limit length of preemptions
- Log will be reviewed to look for patterns
- Variable preemption recognizes relative importance of the signal



# Headway Control System

- Premium placed on reliability and maintaining even headways
- System has capability to modify schedules to control headway
- Region will work with the Contractor to prepare guidelines



# End of the Day

- Bus returns to the garage
- Data held on-board is uploaded through the wireless LAN
- Transferred to relevant internal systems including the scheduling system
- Major data transfer occurs at night
- Analysis can then be performed to improve the system



# Innovative Features

- Flexible priority measures
  - Amount of priority can be set by signal & time of day
- Log all priority requests
  - Analysis for patterns
- Headway Control
  - Allows vehicle spacing to be dynamically controlled
- TVM's connected to the system
  - Control Centre and drivers notified when not working
  - Can dispatch repair



# Implementation

- Scalable to incorporate YRT
- Test vehicle in operation by Spring 2005
- Quick Start vehicles tested by August 2005
- Retrofit of YRT buses to follow
- Transit Control Centre in design
- Traffic Control work underway
- Quick Start running in September 2005



# Cost Information

- Major cost elements
  - In-vehicle Systems \$ 2.75 million
  - AVL & CAD \$ 2.0 million
  - Scheduling/Runcutting \$ 0.5 million
  - Fare Collection \$ 5.0 million
  - Traveller Information \$ 2.5 million
  - Traffic Signal Priority \$ 3.0 million
  - Total \$ 15.75 million

