TTC Environmental Plan - Initiatives and Implementation

Parks and Environment Committee
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Toronto Transit Commission

TTC Environmental Plan - Initiatives and Implementation

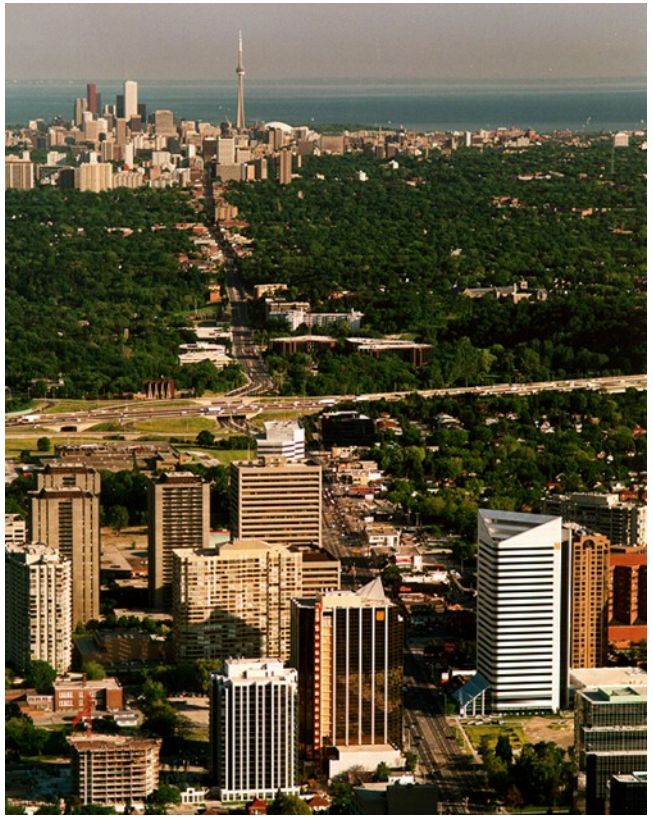
Presentation Overview

- Climate Change, Clean Air & Sustainable Energy Action Plan
  - TTC Participation
  - City Targets
- TTC's Environmental Initiatives
  - Corporate Environmental Policy
  - Progress & planned actions

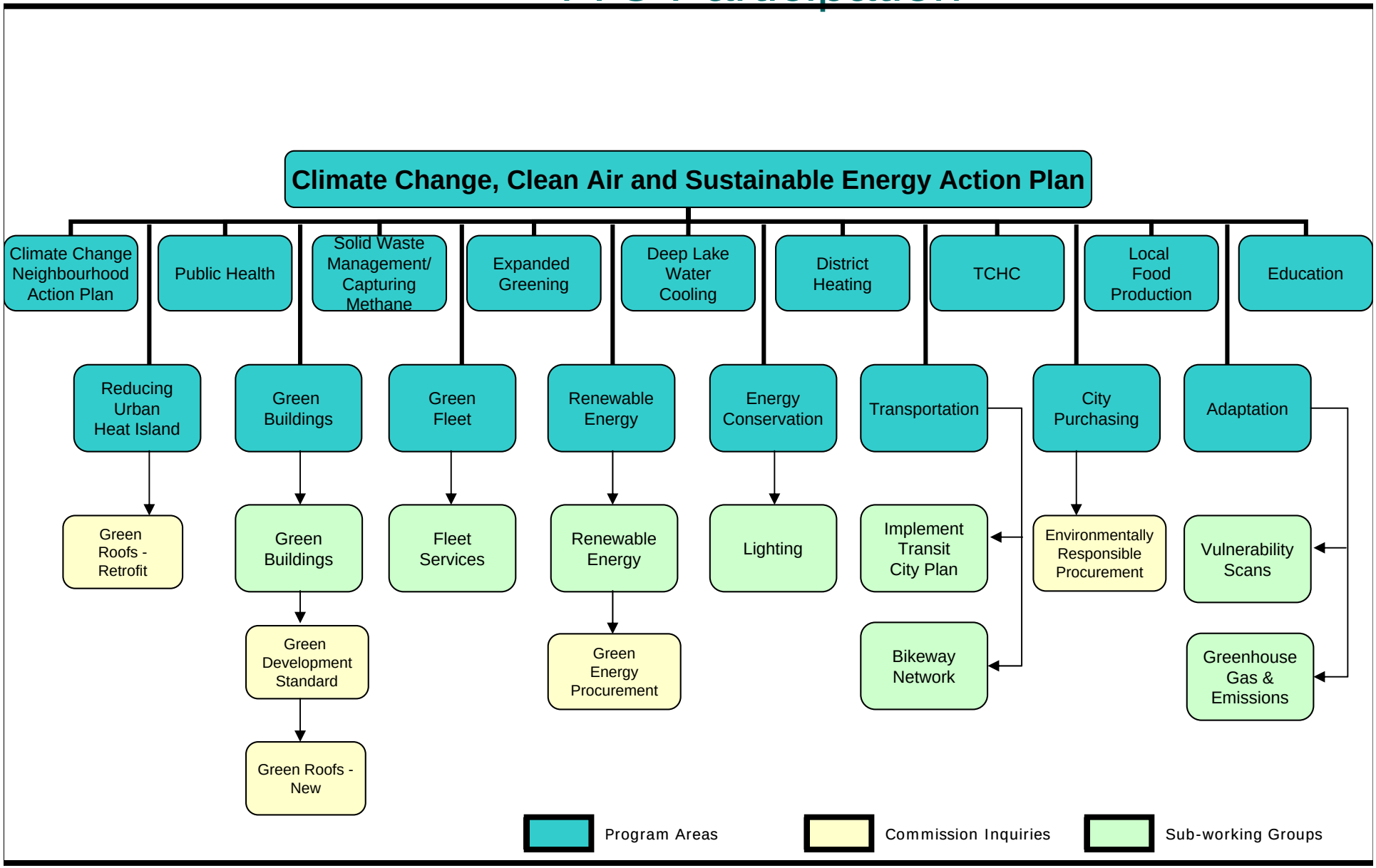
City of Toronto Initiatives

City of Toronto has committed to:

- Address climate change impacts
- Improve local air quality
- Encourage sustainable development
- Lead by example through coordinated effort of Agencies, Boards and Commissions



City Requests, Commission Inquiries and TTC Participation



TTC Environmental Plan – Participation on City Committees

TTC participates on the following:

- Executive Environment Team
- Steering Committee: Cost Benefit Analysis of Green Development Std.
- Renewable Energy Working Group
- City Power Purchase Working Group
- Executive Fleet Management
- City Waste Diversion Team
- City Corporate Smog Team

City Targets –
Climate Change and Smog Reduction

Greenhouse Gas (GHG) emissions reduced from 1990 levels:

- 20% by 2012
- 30% by 2020
- 80% by 2050

Smog causing pollutants reduced from 2004 levels:

- 20% by 2012

GHG and SMOG Reduction Targets – Proposed Study & Actions

Study to establish 1990, 2004 & 2006 baseline consumption:

- Diesel fuel
- Gasoline
- Natural gas
- Electricity

GHG and SMOG Reduction Targets – Proposed Study & Actions

Once baselines established:

- Recommend measurement system & next steps to reduce GHG's/SMOG without reducing transit service
- Build Environmental Management System & identify responsible areas
- Establish Goals
  - measure, verify and report

TTC's Environmental Policy

The TTC commits to:

- reduce the environmental impact from its facility and vehicle operations, and
- commits to comply with all legal and applicable requirements.

Transit and the Environment

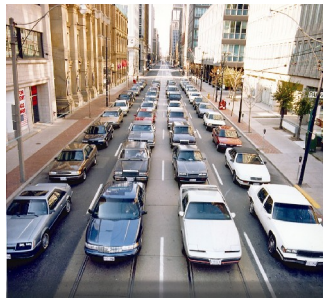
TTC Vehicles replace Cars

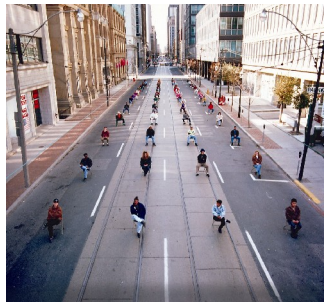
Replacing more than 1 Million vehicle-trips daily

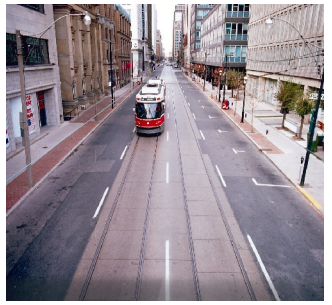
Current ridership exceeds 450 Million passengers yearly

A.M. Rush:

- Bus = 50 cars
- Streetcar = 70+ cars
- SRT Train = 200 cars
- Subway train = 900 cars







Transit and the Environment – Toronto Transit City – Light Rail Plan

- Plan completed in 2007
- Establishes a network of rapid transit projects across all parts of Toronto
- Key element in City's commitment to sustainable future and liveable city
- Environmental Assessments in progress

Diesel and Gasoline Fuels - Efficiency of Use and Conservation

Bus Fleet

- Using B5 blend bio-diesel with Ultra Low Sulphur Fuel
- 150 hybrid buses operating in 2007
- Future purchases to be hybrids
  - 334 hybrids being added in 2008
  - 2008 = 33% fleet, 2010 = 45% fleet
- Operators trained in fuel efficient driving techniques
- Considering revised set temperatures and increased tire pressures

Diesel and Gasoline Fuels - Efficiency of Use and Conservation Cont'd

Non-Revenue Vehicles

- Purchasing smaller/lighter vehicles
- Optimizing fuel efficiency by motor size
- Purchasing gasoline vehicles where possible
- Using bio-diesel when fuelled by TTC
- Hybrids to be considered for future purchases where feasible – 4 purchased in 2007
- Green Fleet Plan
  - Green Fleet Transition Plan consistent with City
  - Green Fleet Plan to be established in 2008

Diesel and Gasoline Fuels - Efficiency of Use and Conservation Cont'd

Non-Revenue Vehicles

- Recommending Operator driving techniques to optimize fuel use
- Recommending Operator procedures for start up, drive away and idling as per City Fleet Operations
- Right-sizing vehicles: crew cabs used to eliminate need for second vehicle

Electricity –
Efficiency of Use and Conservation

New Subway Train Purchase

- Energy efficiencies considered
  - 8-10% savings/passenger compared to T1
  - Vehicle weight reduced
  - Drivers trained for energy efficiency
  - Designed for future improvements (ATO)
  - Regenerative braking for all subway trains by 2010

Electricity –
Efficiency of Use and Conservation Cont'd

New Streetcar/LRT Purchase

- Energy efficiencies considered
  - Stringent weight control
  - More efficient propulsion system
  - Longer vehicle to carry more passengers
  - Highly efficient regenerative braking

Electricity –
Efficiency of Use and Conservation Cont'd

439 M kWh used in 2007

- 75% for traction power

- Conservation/Demand Management Studies with Toronto Hydro including Facility Audits
  - Leading to future retrofits
  - Subject to payback periods
- Solar panel powered microwave transmitters successfully tested
- Energy conservation staff hired

Electricity –
Efficiency of Use and Conservation Cont'd

- 94% of subway trains and 100% of streetcars have regenerative braking
- Investigating potential wayside storage of traction power
- Lighting replacement program in subway, surface facilities and offices
- Investigating further upgrades to lighting, chillers, capacitors, appliances
- Conversion to Natural Gas, Controls Automation and Peak Saver where justified by savings

Electricity –
Efficiency of Use and Conservation Cont'd

25% Green Energy by 2012

- 10% of electricity supplied to be green by 2010
- 15% premium through Toronto Hydro
    - Implemented over period of time
    - Cost anticipated to be $1.6- $2.6M/yr
    - Subject to funding source being identified
    - Commencing in 2009
- Approved by Commission December 2007

Natural Gas –
Efficiency of Use and Conservation

Bus Garage Program

- Computerized Building Management System
  - Selected garages
  - Temperature setback in bus storage areas
  - 9.5% savings per location achieved in 2007
- Future plan for more facilities
- Monitor/report overhead door position for additional energy savings

Pollution Prevention -
Hazardous Materials Management, Waste Reduction & Recycling

Corporate Environment Programs

- Waste handling
- Corporate Spills Response Program
- Training
- Monitoring & Removal of Underground Storage Tanks
- C of A's (Air)

Hazardous Materials Management

- 55% reduction to date

Purchasing Chemicals

- Assess performance, health & safety, environmental impact and cost

Pollution Prevention -
Hazardous Materials Management, Waste Reduction & Recycling Cont'd

Noise and Vibration

- Subway and streetcar vehicles
- May be caused by wheel/rail defects
- Lubrication employed
- Rail grinding program
- Wheel inspection and truing
- Isolated double ties for subway track
- Isolation boot for streetcar rail

Pollution Prevention -
Hazardous Materials Management, Waste Reduction & Recycling Cont'd

- Solid Waste Diversion
  - 73% rate achieved in 2006
  - 80% target for 2010
- Recycling Contracts
    - Metals, batteries, solvents, cardboard, scrap wood, non-revenue vehicle tires, and toner cartridges
- Surplus assets sold for recycling
    - Buses/subway cars
    - Computers

Pollution Prevention -
Hazardous Materials Management, Waste Reduction & Recycling Cont'd

- Waste reduction, diversion & recycling
  - Subway waste separation and recycling
  - Vehicle clean recycling program
  - No waste office program
  - Hillcrest waste transfer facility
  - Solid waste sorted by Turtle Island

Environmentally Responsible Procurement

Green Procurement Policy

- Consultant retained to develop comprehensive approach
- Policy developed
- Seeking TTC Approval July 2008

Green Design & Buildings
New Subway & LRT Vehicles

Environmental impact considered

- Oil-less air compressors
- Refrigerant to be R407C

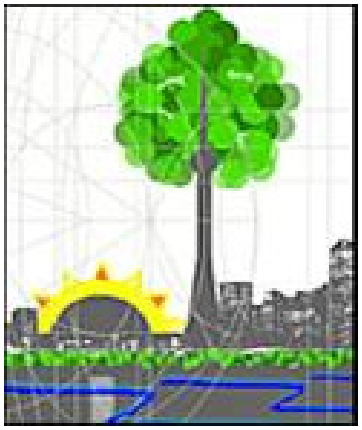
- Recycling plan required for end-of-life
- Environmental report required
- Some materials prohibited/restricted

Green Design & Buildings
Design Standards - Buildings

- Durable Building Construction
- Energy efficiency
- Low VOC Materials
- CFC/HCFC free materials
- Mitigating Construction Impacts
  - Erosion control
  - Dust control
  - Protection of watercourses

Green Design & Buildings
Toronto Green Development Standard

- Standard to be adopted, where feasible
  - Many requirements already followed
  - Green Roof
    - Victoria Park, Eglinton West Subway Platform
  - Cool Roof where Green Roof not feasible
- Pilot Projects to be used
  - Where new technologies considered
  - To develop new design standards
  - Green Roof Pilot Project: Victoria Park Station
  - Cool Roof Pilot Project: Wilson Carhouse Addition



TTC Environmental Plan - Summary

Significant progress made in many areas
- cost-effective innovation and self-assessment

Recent success in solid waste reduction
- measurement based approach used

Approach for next steps includes:
- Measurement based
- Goals, verification and reporting
- Pilot Projects for new technologies

End of Presentation