

# Agenda: October 18

- Updates
- Seminar: 2 topics
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- **Lecture 8:** Sustainable Transportation  
History, Problems and Solutions

# Sustainable Transportation

## History, Problems and Solutions

Historical transportation included wind for sailing ships, horses, boats on rivers and lakes - small scale and “sustainable”

Internal combustion engines: trains, steam ships, automobiles, airplanes

- initially had minimal environmental impacts but became unsustainable with increasing use.

**“A sustainable transport system is one that provides transport and mobility with renewable fuels while minimizing emissions detrimental to the local and global environment [while] preventing needless fatalities, injuries and congestion”.** (Source: William R. Black, 2010, *Sustainable Transportation: Problems and Solutions*)

# Sustainable Transportation Problems and Solutions

Five problems (at least) to solve:

1. Finite and diminishing fuel reserves
2. Emissions into the local atmosphere with impacts on human and environmental health
3. Emissions into global atmosphere causing climate change
4. Loss of life and injuries\*
5. Traffic congestion

\*Road crashes are the leading cause of death among young people –they accounted for 35% of all deaths among 15-19 year olds and 30% of all deaths among those age 20-24.

# Transportation history of Ontario: Footpaths to Freeways



Moma Markovich: Born in Belgrade, Serbia in 1902. Artist, postage stamps, illustration of textbooks, cartoonist.



Until the late 1700s people walked, rode horses or in horse-drawn carriages. Longer distance transport was with the boat or canoe on rivers and lakes.



1793: Soldiers and local settlers built first section of roadway in present day Ontario - eight kilometres of bumpy trail between Kingston and Bath.

1796: Yonge Street was built by the British military from Toronto to Lake Simcoe.

# Roads/tracks in the 1800s



People arriving in Markham in a horse-drawn carriage, date unknown.

Source: MTO collection.

- Usually simple dirt tracks; road improvement included “corduroy” roads of cut logs, “often wheel-destroying rides which horses shied away from for fear of breaking their legs” (MTO archives).
- Roads were primitive, often only usable in mid-summer . . . or in winter when packed snow allowed sleigh travel.
- Tolls on some roads



Artist: Moma Markovich

In the following slides consider themes of

- “sustainability”
- features or policies that come and go
- transport safety
- emissions

# Early 1900s

- 1898: Ontario's first automobile
- 1901: legislation provided provincial funding for local road improvements, mainly rural
- 1903: first provincial legislation governing automobiles
  - Speed limit of 15 mph
  - 24 km/h) and requirement for vehicles to be registered.
- 1913: more than 17,300 motor vehicles registered in Ontario, including: 223 electric vehicles, 39 steam powered and nearly 1000 "trucks".



Near London, Ontario (1915)



Toronto – Hamilton Highway (1916)



# The 1920s: “a decade of firsts”

- Department of Public Highways established
  - snow removal
  - official Ontario road map
  - driver licensing
  - a trucking act
  - gasoline tax.
- In 1927 everyone driving a motor vehicle in Ontario required an operator's licence.
- Speed limit of 25 mph/24 km/h
- First traffic lights in Toronto and Hamilton
- In 1926, the last toll road in Ontario is removed.



# The 1930s

- “Unemployment relief”  
The “Middle Road” between  
the Lakeshore (Hwy 2) and  
Dundas Street (Hwy 5)

Now known as the Queen  
Elizabeth Way (1939)

- Name changed: Department  
of Highways (DHO)
- Traffic enforcement duties  
were transferred from the  
department to the Ontario  
Provincial Police.



- Broken white lines to  
mark lanes and the  
centre of highways  
(Photo taken near  
Oakville, 1931)

# “Nipigon Junction of Hwy 17 & Hwy 11” (artist Moma Markovich)



Nipigon River Bridge opens on September 24, 1937

# 1940s: War and safety policies

New roads mainly provided access to munition plants, military camps and airfields. Both materials and labour were in short supply - windshield decals replaced licence plates due to the metal shortage.

## Other Highlights:

- Early work on what is now Hwy 401 and 400 begins
- 1943: completion of 250 km gravel road between Hearst and Geraldton provides a cross-Canada highway route.
- 1949: first meeting with the federal government on funding for construction of the Trans-Canada Highway.
- DHO (Tom Mahoney): develops system to record and determine causes of road accidents. Vital in improving future road safety.

# 1950s

Economic boom in Ontario and rapid population increase.  
The Trans-Canada Highway Agreement of 1950 for a sea-to-sea road network.

But “a dark period in DHO history”.

1953: Audits discovered that several DHO staff and private contractors had defrauded the federal and provincial governments of about \$7 million on some road projects in Northern Ontario - major scandal. Three companies were fined and made repayments, and a federal inspector and a DHO engineer were given short jail terms and fines.



Ottawa billboard 1950

# 1960s: Highways and GO trains

- The Trans-Canada's Lake Superior route opens
- The 401 fully completed
- Development of northern remote airports
- Vehicle congestion on the QEW prompts experimental GO Train service - an immediate success (first year, 2.5 million people used the service).
- Major bridges built . . .



GO Train service was launched along the Lakeshore between Oakville and Toronto in 1967. Service between Hamilton and Pickering soon added

# 1960s: International bridges



*Queenston - Lewiston Bridge*  
(Most recent opened in  
1962)

Length : 486 m



Sault Ste. Marie  
International Bridge (1960 -  
opened in 1962)

Length : 4,506 m

# Pigeon River bridges



1934 to 1964

Source: Thunder Bay Historical  
Museum Society



# 1968: Planning for northern airports

- Ontario introduced the Airport Act in 1968: Remote Northern Airport Program (RNAP)
- Airports were established in remote communities (i.e. north of the 50th parallel) to serve by air rather than by all-weather roads.
- Change in the way of life for the residents of northern communities.



# 1970s: Name and policy changes

- DHO becomes Ministry of Transportation and Communications (MTC)
- Integration of road, rail, air and marine services
- Planning of the "highway in the sky" (remote airports in northern Ontario)
- Local residents hired for site prep
- Most remote airports within walking distance of communities vehicles uncommon
- 1977: Change to metric system.



1976: seat belt laws came into effect. Almost immediately driving fatalities declined.

Lower speed limits for Ontario to conserve fuel. highways: 112 to 96 km/h; 96 and 88 km/h to 80 km/h.

1980s



Fort Hope (1986)

**In 1981, during the International Year of the Disabled Person, the Ministry begins providing a 75 per cent subsidy to transit service providers to improve accessibility for disabled persons.**

# 1990s

Highway 407 opens, becoming the world's first all-electronic, open-access toll highway.



# 2000s

- New relationships with municipal and federal governments with funding for infrastructure planning and transit systems. This included sharing a portion of provincial gasoline tax revenues for municipal transit and provincial control of GO Transit.
- The MTO improves road safety, ranking every year as either first or second for safest roads in North America.
- In 2006, the “one person, one seatbelt” law comes into effect, including properly secured seats for children.
- In 2007, rapid bridge replacement technology is first used in Ontario and street racing legislation comes into effect.
- Beginning of Presto, an electronic fare card that allows riders to transfer across multiple transit systems.
- In 2009, speed limiters for large trucks come into effect and now illegal to use hand-held devices while driving.

# The present decade

- MTO announces an electric vehicle incentive for buyers.
- MTO releases a framework to integrate sustainability into all the Ministry's programs, policies, and internal operations.
- Rapid bridge replacement The ministry continues to use to minimize traffic disruptions.

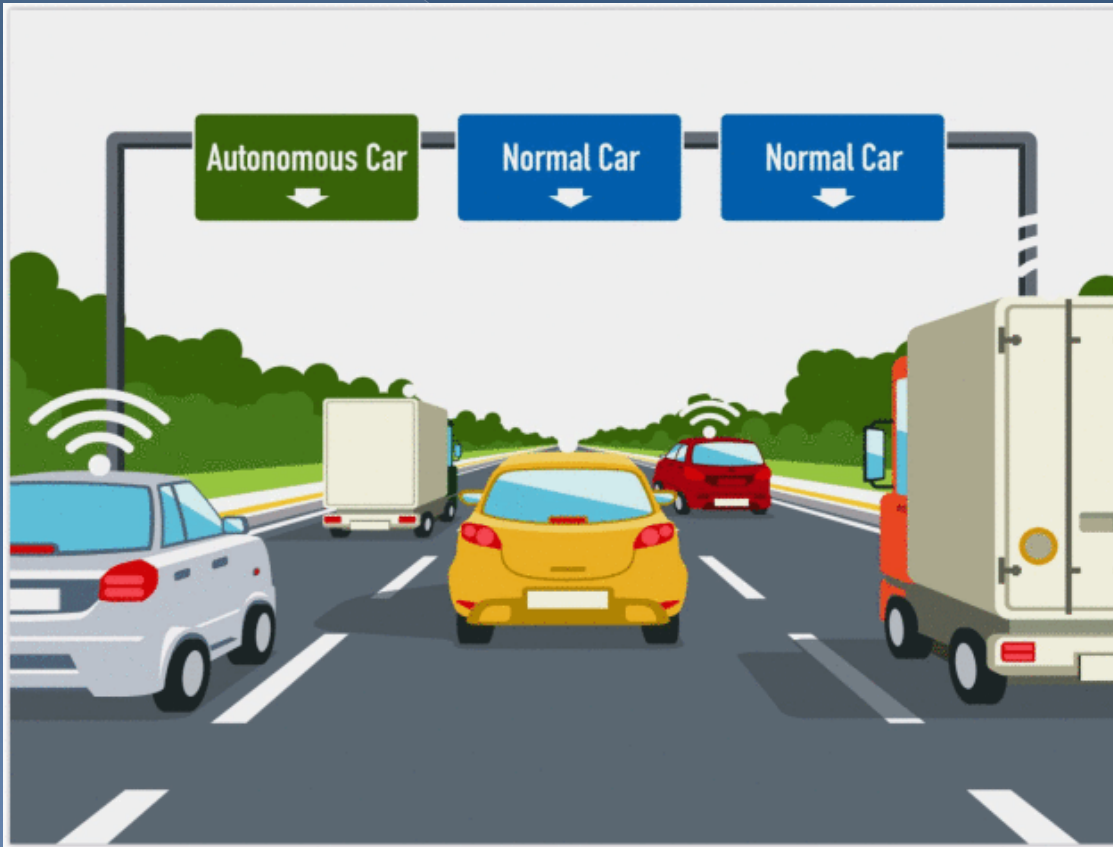
Examples





Family-sized car uses the sun as power and supplies energy back to the grid at the annual World Solar Challenge in Australia. The Dutch Stella Vie, carried five people at an average speed of 69kmh Darwin - 3,000km - through middle of Australia to Adelaide. 41 vehicles

Another Dutch car, Nuna 9, won at an average speed of 81.2kmh



Robocars will dominate roadways – eventually

Transition needs to include a mix

Reduced congestion, emissions and major drop in deadly crashes.

Based on computers that never make mistakes



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