



*driving AV deployment*

The Canadian Automated Vehicles Centre of Excellence

# WHY AUTOMATED VEHICLE ZONES MAKE SENSE

ITS CANADA ACGM 2014 (Victoria)

June 2, 2014

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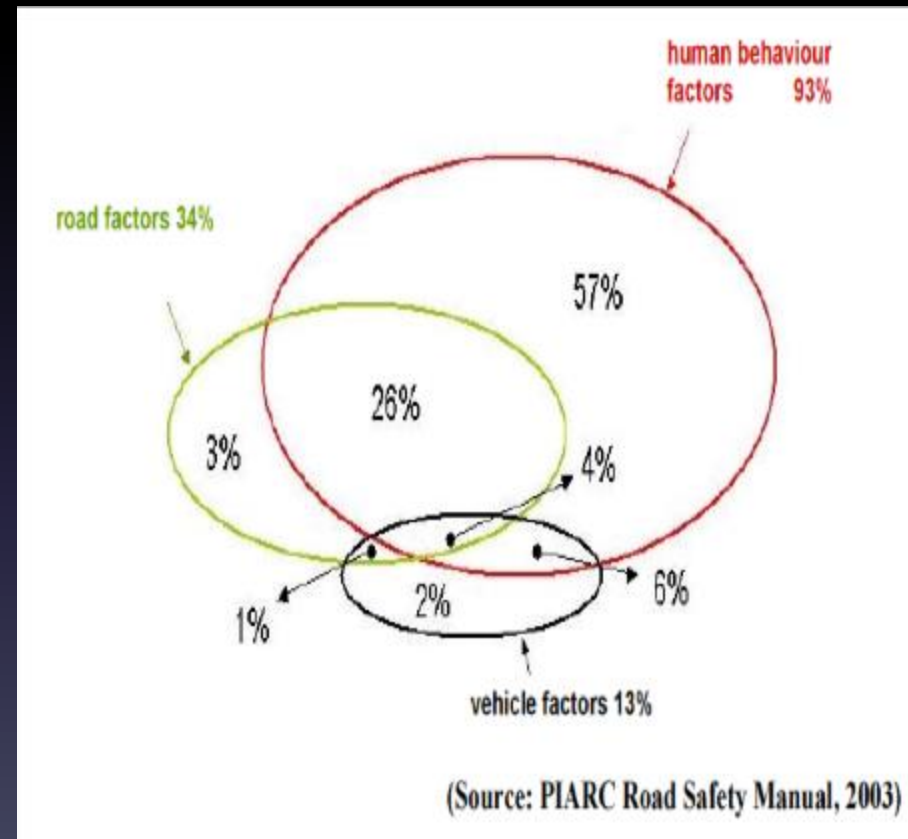
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# AUTOMATED VEHICLES (AVs)

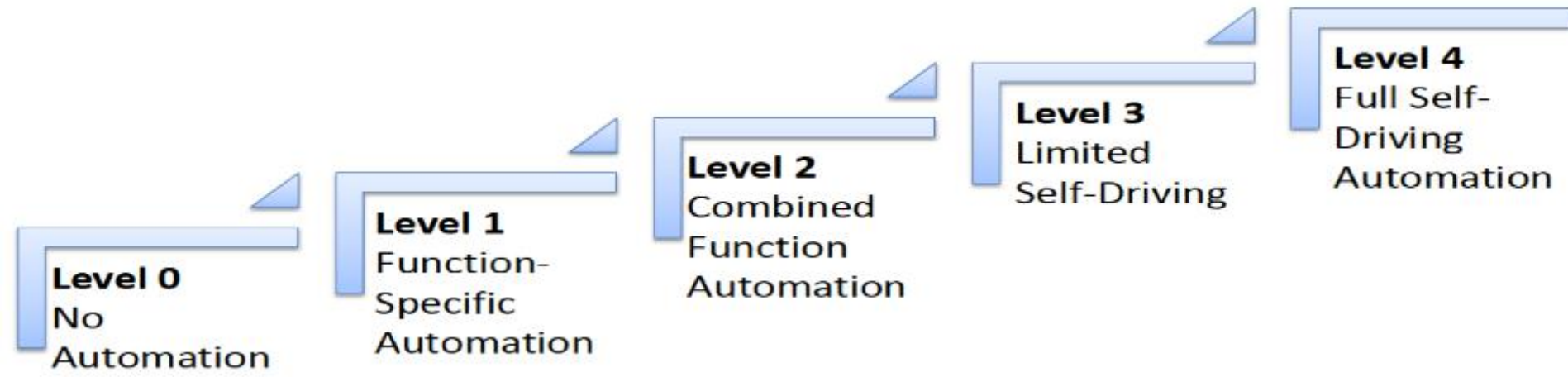
- Benefits maximized when human drivers are taken out of equation
- City's desire to be the best – Introduce **Automated Vehicle Zones (AVZs)**



# FULLY AUTOMATED VEHICLES AND CITIES

- Level 4- human no longer required.
- Fully automated vehicles offer immense benefits
  - Chauffeur like service
  - Move people and goods at cheaper cost
  - Lower insurance premiums
  - Reduced parking requirements

NHTSA Levels of Automation



# BENEFITS

## TRANSPORTATION PERSPECTIVE

- Road safety (Canada = 2,006<sub>[2011]</sub>, 2007 \$62bn or 4.9% GDP)
- More sustainable (vehicle not idle 93% of time)
- Likely transition to electric propulsion and reduced emissions
- More efficient passage through intersections
- Shared AV fleets and aTaxis
  - replace/reduce requirements for some bus transit services
  - cheaper and more direct service for intra-city travellers

# BENEFITS

## TRANSPORTATION PERSPECTIVE

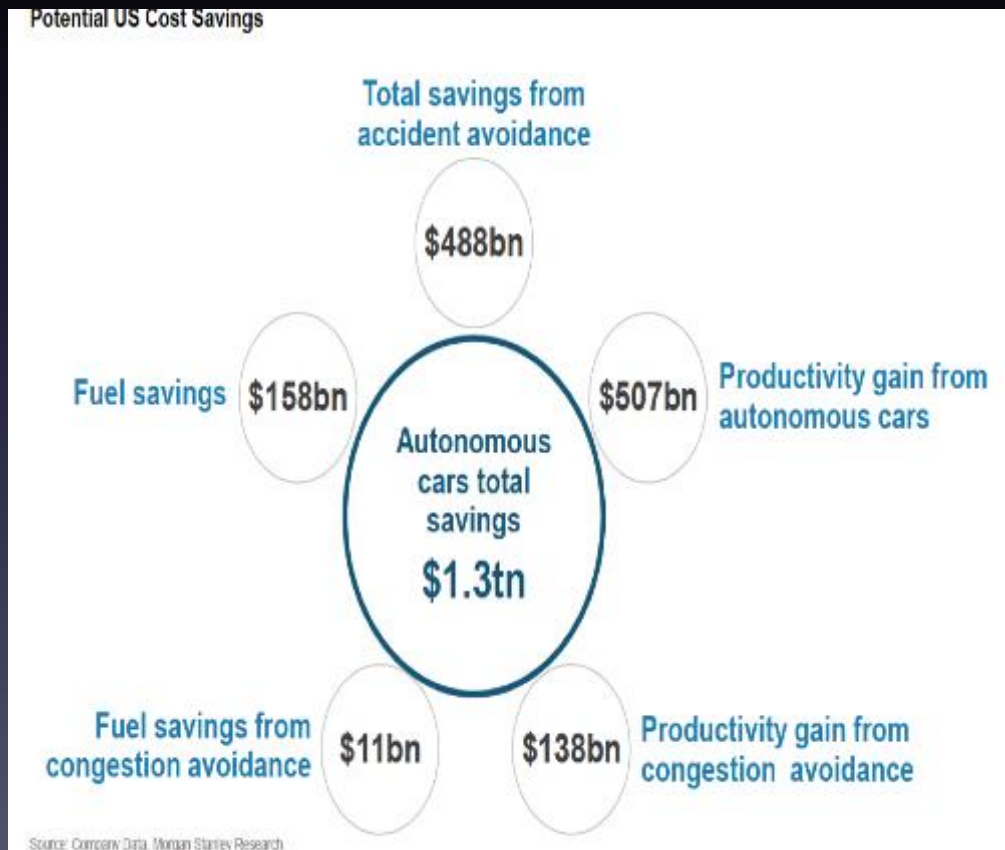
- Greatly improved access to road transportation for some that are:
  - disabled,
  - seniors,
  - don't have a driver's license,
  - too young,
  - medically-at-risk, etc.
- Automation of repetitive service tasks such as road-sweeping and snow-plowing
- Commuters can use time more productively (average Canadian spends almost 50 minutes/day commuting)

# AUTOMATED VEHICLES IMPROVING LIVABILITY

MERCER Quality of Life Index:

- Political and Social Environment
- Socio-cultural Environment
- Medical and Health Considerations
- Schools and Education
- Public Services and Transportation
- Recreation
- Consumer Goods
- Housing

Morgan Stanley Estimated Savings for US. For Canada, value could be approx. 10% of this = \$130bn/yr.



# Political and Social Environment

- Minimal infrastructure investments
- Costs users approx. 40% less than owning a private vehicle

Hence,

**Reduction in taxes and personal expense,**

**or increased spending budgets for other areas.**

# Socio-cultural Environment

State of the Art – Induct Navia

Low speed electric shuttle – NHTSA Level 4 (unmanned) at up to  $\approx 20\text{km/h}$  being demonstrated in Europe, Singapore and the US.  
Commercially available from January 2014.

Greater freedom for :

- Disabled
- Seniors
- Medically-at risk
- Too poor
- Too young
- Un-licensed
- Banned from driving





# Medical and health considerations

- Significant reduction in the number of vehicle crashes, injuries and fatalities
- Expected that the most cost-effective AV propulsion system will be electric
  - Expect a reduction in vehicle emissions within cities with consequential benefits to heart and lung health
  - Air pollution blamed for 21,000 premature deaths/year in Canada – vehicle emissions a major contributor

# School and Education

- Driver could become an overseer, that can be far more engaged in the children's welfare
- A larger number of smaller vehicles could be deployed allowing greater optimization of routes
- The school bus/vehicle no longer has to be dedicated to school use only
- Intra-day transportation can be provided much more easily allowing a greater variety of school visits at a lower cost

# Transportation and Public Services

- Improved safety
- Improved efficiency of the road network
- Improved public transport provision
- Improved journey time reliability in congested corridors

# Recreation

## Chevrolet EN-V (Magic version pictured)

2-person, 2-wheeled electric concept vehicle.

Due for testing and demonstration starting in Tianjin, China.

- Improved door-to-door access to recreation for many that are currently disadvantaged in their ability
- People may go out more: movies, restaurants, pubs, etc.



# Housing

Two diametrically opposite results of automation

- Sprawl - Some people will be willing to commute further
- Intensification - Shared Automated Vehicles reduce need for parking in urban centers
- With policies, can promote active transportation and walkable neighborhoods
- Impacts the Transit-Orientated-Development paradigm

# WHY CITIES MIGHT DESIRE AVZs

- Natural 'evolution' to driverless take decades
- AV benefits limited by sub-optimal human drivers
- AVZs maximize benefits as rapidly as possible
  - 'Revolutionary' implementation
  - benefits within 4-8 years

**Creation of Automated Vehicle Zones (AVZ)**

# How a City Might Implement AVZs

- Fix AVZ deployment date, say 4-8 years of planning and preparation
- Promote deployment of AV technology in this period
- Incentivize AV take-up
- Population has time to plan personal transition
- Implement AVZ
- Population sees benefits before AVZ official start date

# Indications that AVZs Can be Seen as a Natural Progression

- “In time to come, there will be driverless electric cars, in which by then private transport will become less important and therefore, less reliant on road service and land to be set aside for roads and car parks”

--- Khaw Boon Wan, June 2013

Singapore National Development Minister

- “I would love to find a neighborhood, and be the first big city in the world to have a driverless car neighborhood”

--- Eric Garcetti, November 2013

Mayor of Los Angeles





## Concept drawing of Landsdown Park in Ottawa

Copyright/Courtesy OSEG, Barry Hobin and Richard Brisban Architects, Canon Design and General Motors for the EN-V pods



A Brief Announcement  
2014 IEEE - VTC in Vancouver –  
a chance to meet colleagues, exchange ideas and engage in the future  
of Vehicle Technology and Communications.

[ieeevt.org](http://ieeevt.org) / [vtc2014fall/](http://vtc2014fall/)

# Welcome to VTC2014-Fall in Vancouver!



**2014 IEEE 80th Vehicular Technology Conference: VTC2014-Fall**  
**14–17 September 2014, Vancouver, Canada**



For more information contact [ieeevt.org/vtc2014fall/](http://ieeevt.org/vtc2014fall/) or  
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**[www.cavcoe.com](http://www.cavcoe.com)**

**THANK YOU..!!**

[Quality Streets](#)

(How cities can become more livable by creating AV-only zones);  
by Paul Godsmark; Traffic Technology International, February/March 2014.

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