



Planetary Association for Clean Energy

WholeLife 2018

5G overview

Andrew Michrowski

5G - overview

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$$\Omega = 2 \pi f \text{ (frequency - wavelength formula)}$$

ELF (extremely low frequency) / ultrasound bands

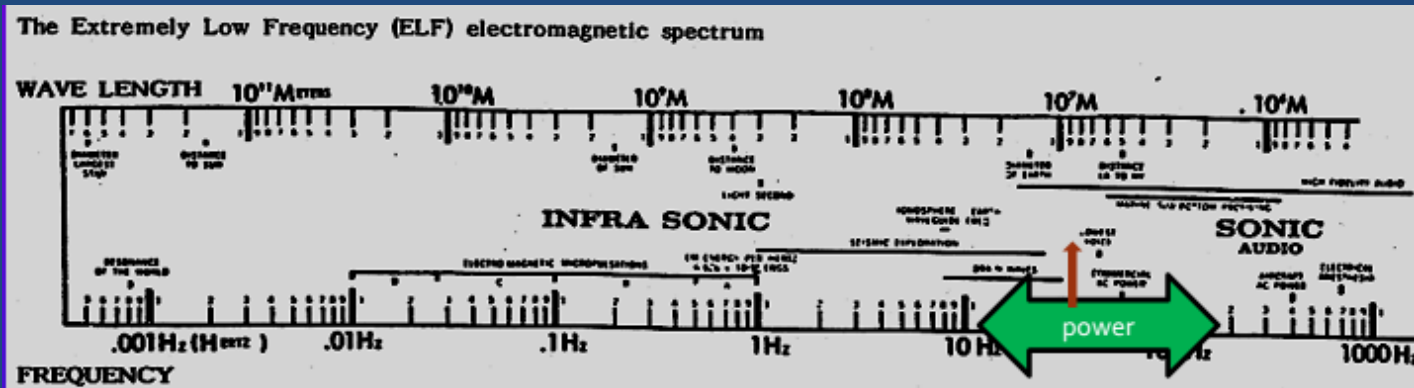
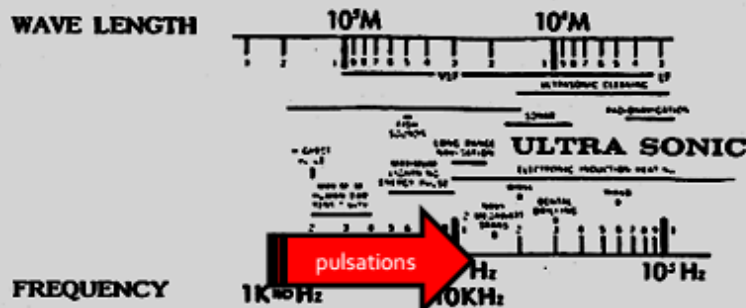


Figure 2

The Very Low Frequency (VLF) electromagnetic spectrum

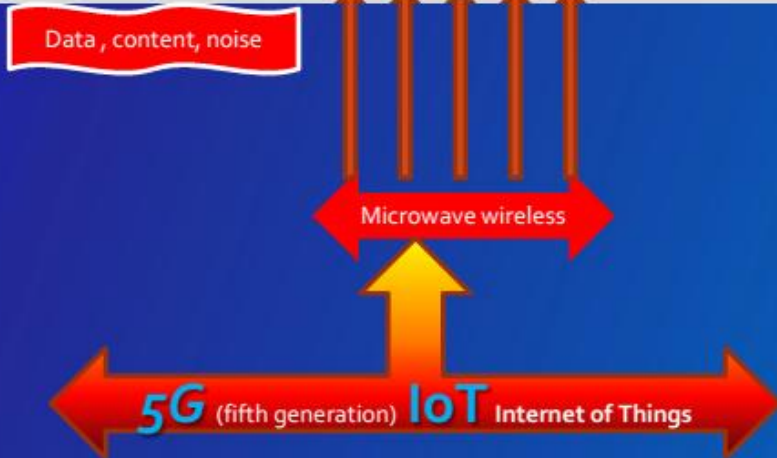
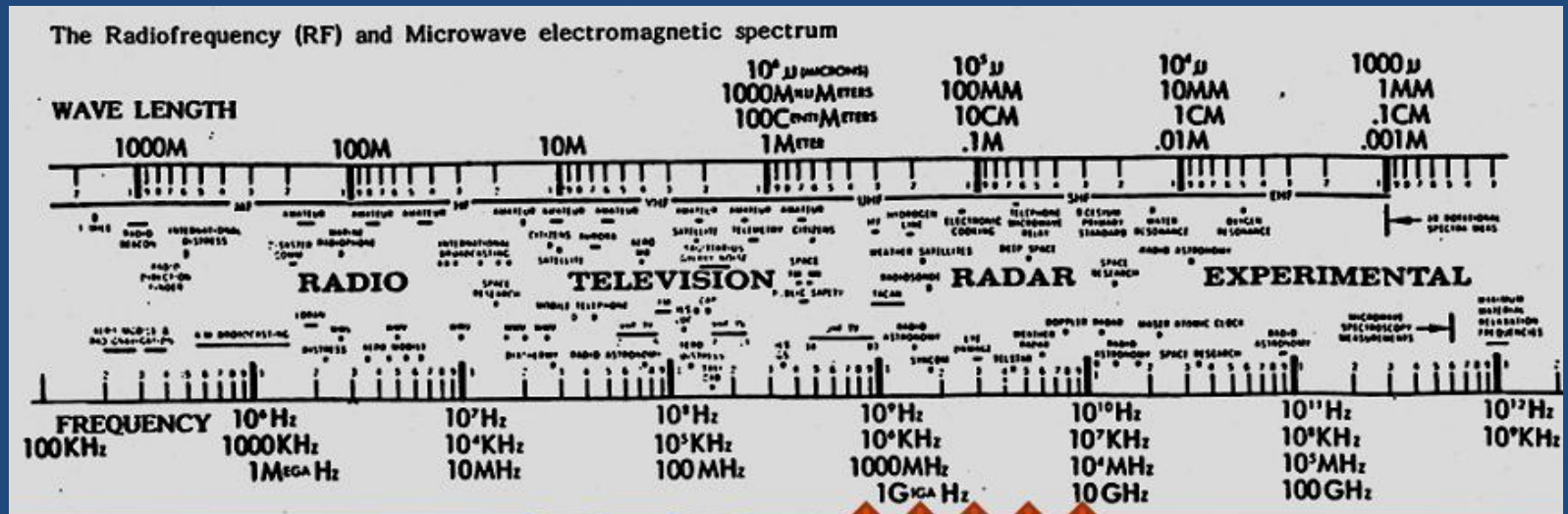


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Microwave band - wireless technologies – spread of 5G

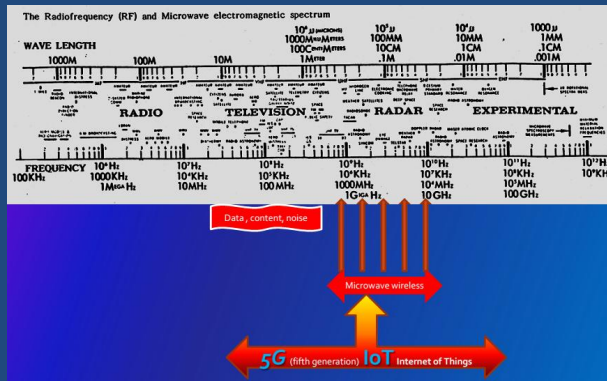


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5G multiple bands interoperability implies:



Redundancy issue:

"A smart coffee maker shouldn't be so clever that it can't make coffee without internet access."

Cumulative, complexity effects, "new radio" analog & digital beamforming, ambient air and water vapour excitation

Public *right-of-way (PROW)* franchise, license, contracts – everyone wants it: cable, cellular, and utilities ...

Beam-forming, antenna arrays integrated into same chip

Severe standardization challenges

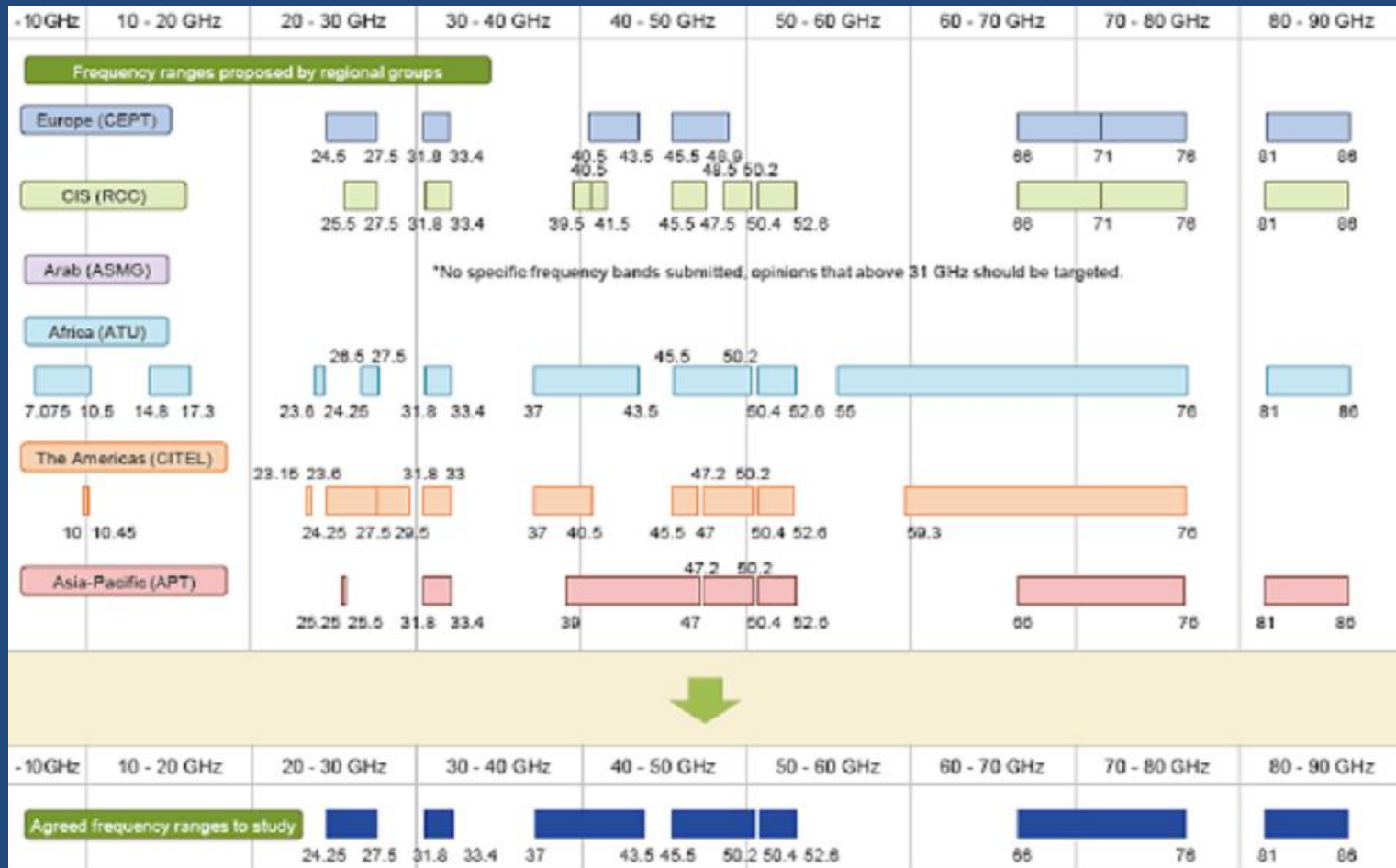
"NextGen" standalone Core "coconnects" also for the military

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5G – world-wide “agreed frequency ranges to study”

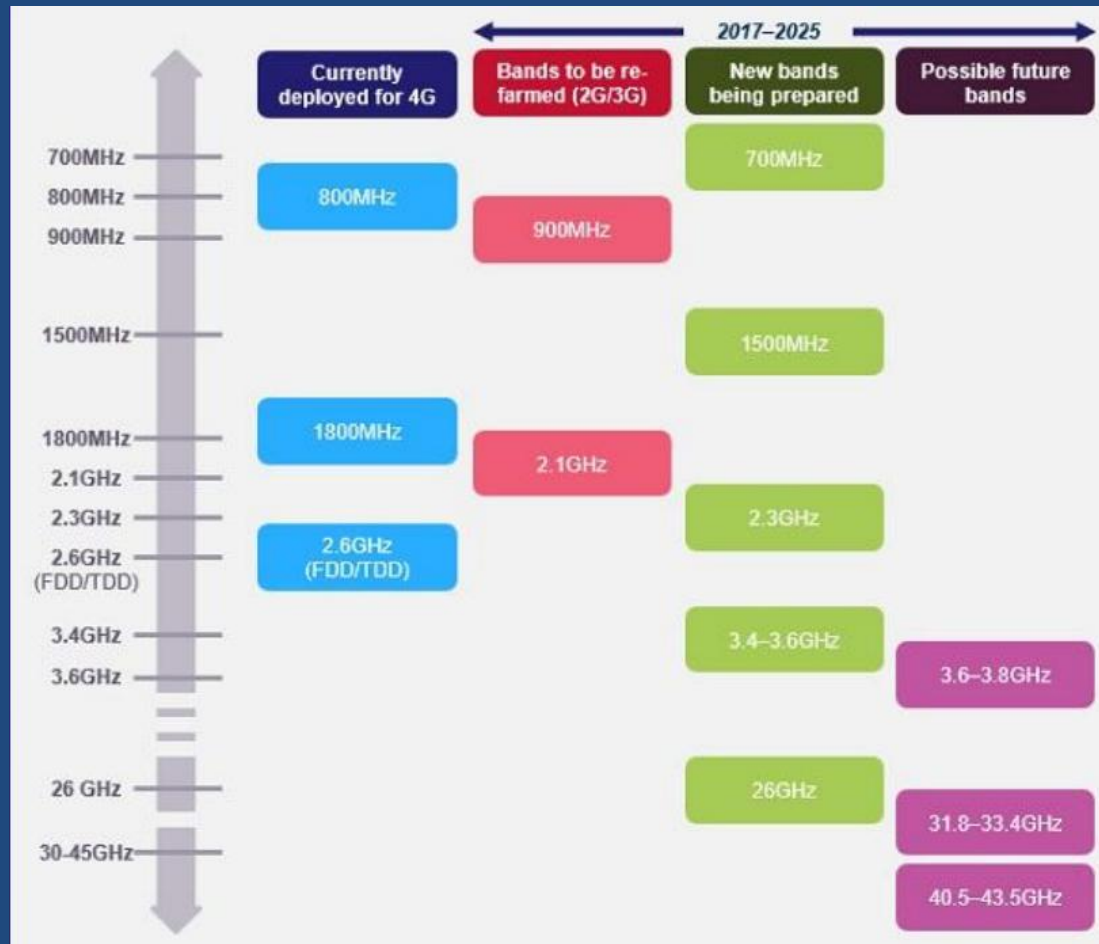


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5G – world-wide 2017- 2025 new & "re-farmed" IOT bands



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5G – world-wide Internet of Things (IOT) "smart grids"



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5G – *so power density-intensive that exposure standards may have to be increased to ensure operational viability.*

*(Already so for FCC car rules @ 2200 X higher power at 3 metres away than European Council EMF guidelines (giving exposure of 220 $\mu\text{W}/\text{cm}^2$ for drivers)
Federal Register 2012/08/13/2012-19732*

NATO is concerned about additional military communications and electronic warfare (COMMS & MIMO) vulnerability.

Brussels METIS 2020 meeting October 5-6, 2018

"Smart meters did not work; let's avoid the same mistake with the Internet of Things."

Seyi Fabode, Partner at Asha-Labs.com

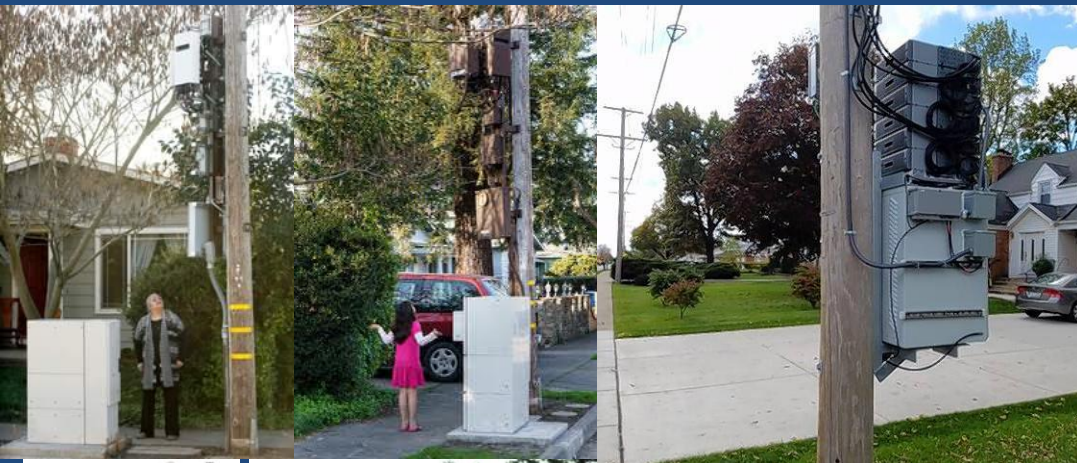
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5G - what it can look like (*trial runs*)

Public Right of Way installations – every 100 metres



Trials in the U.S. and Canada, and the Québec **Microcell** units



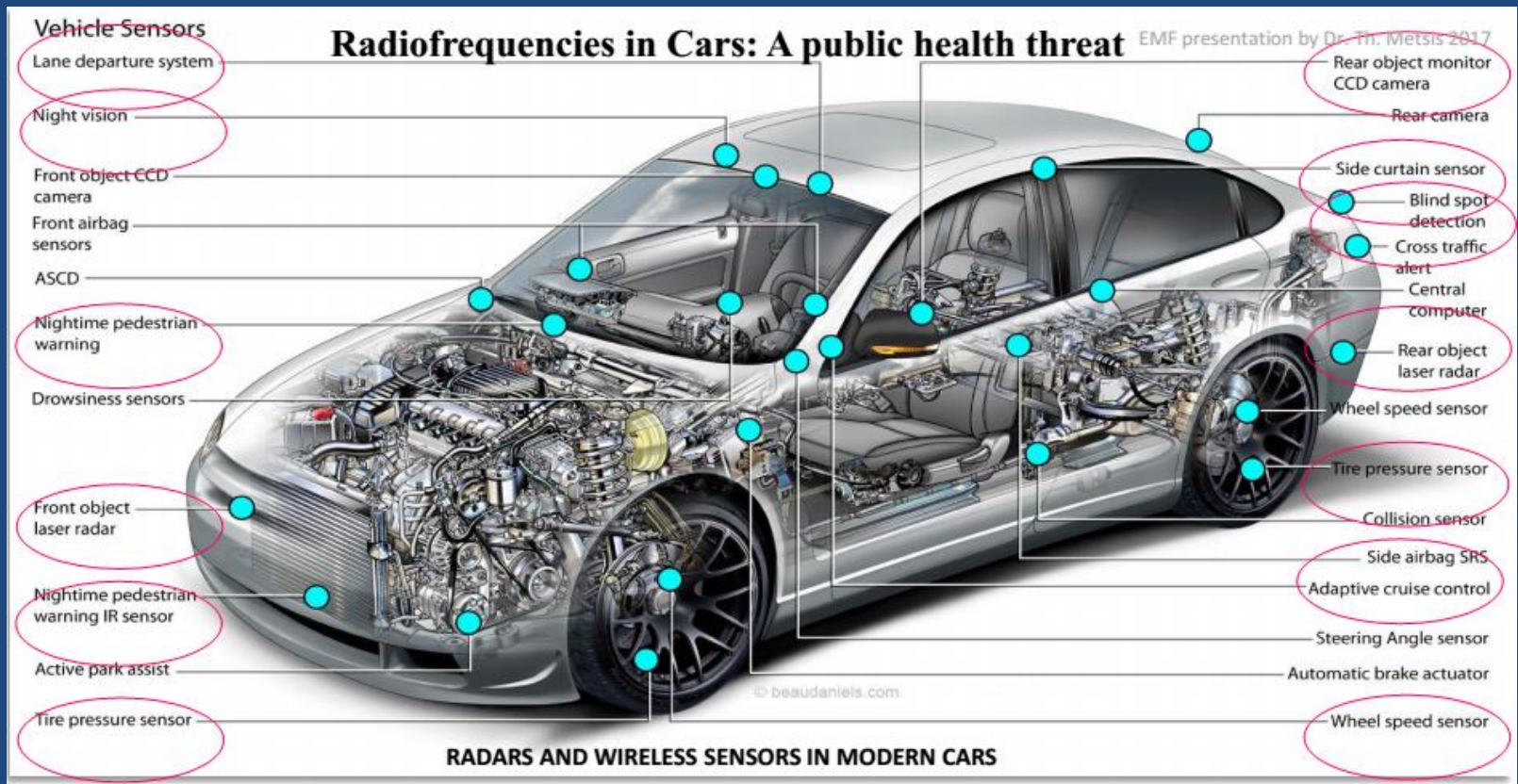
Swisscom Kathrein “Street Connect”
Since 2015

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5G- Car microwaves (~24 GHz and ~77 GHz)



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Microwave emissions associated with cars, including street-side

Frequency range (~ 24 GHz and ~ 77 GHz)

EMF from tires and other sources unique to hybrids

Microwaves from cellphone and those of passengers

Microwaves from **Bluetooth, Wi-Fi** hot spots, and from cell towers

Microwaves from radars of other cars

Microwaves from on-board radar sensors to detect motion and driver alertness

FCC Directive : *elevated radars exposure must continue even when cars idle* ;

With many cars at stop sign could results in exposure to those crossing a street to **over 100 X Safety Code 6** - especially **dangerous** for children.

after: Prof. Kostoff Georgia Tech, 2018

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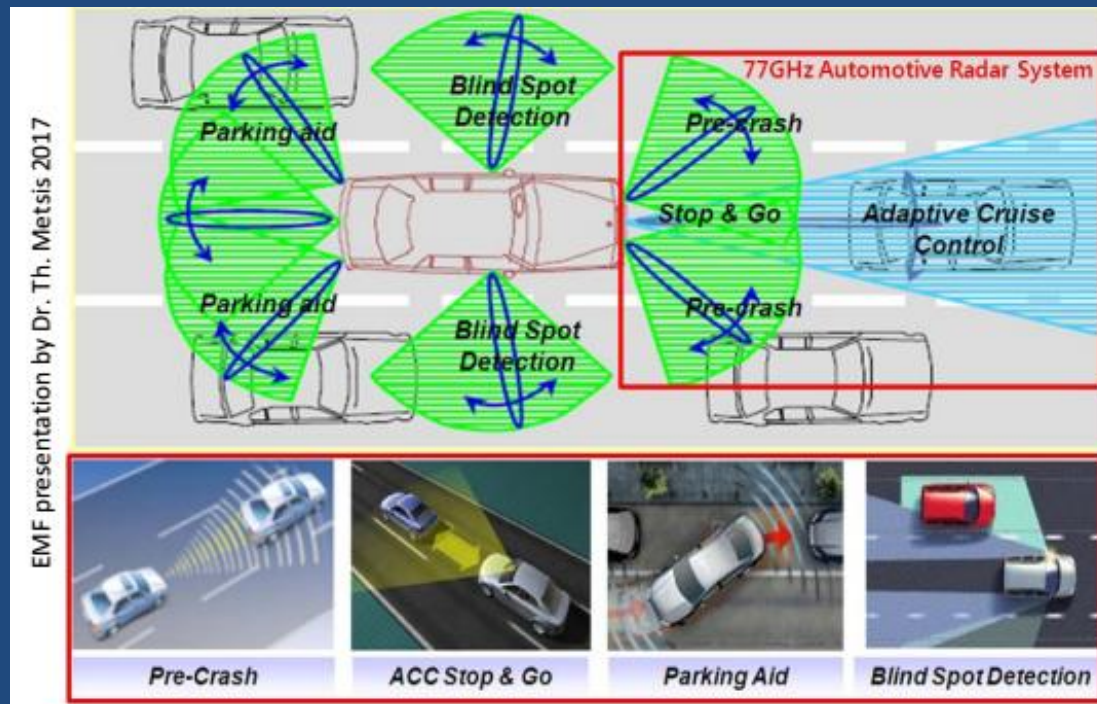
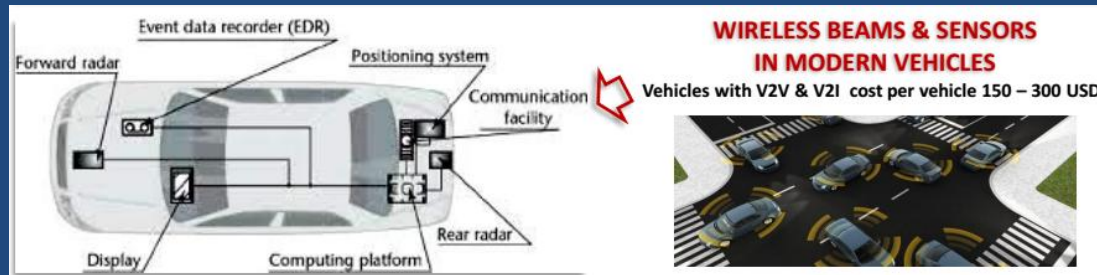
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5G – Car microwaves (2) – beams!



Ottawa cell tower beamforming seen on a wintry pane

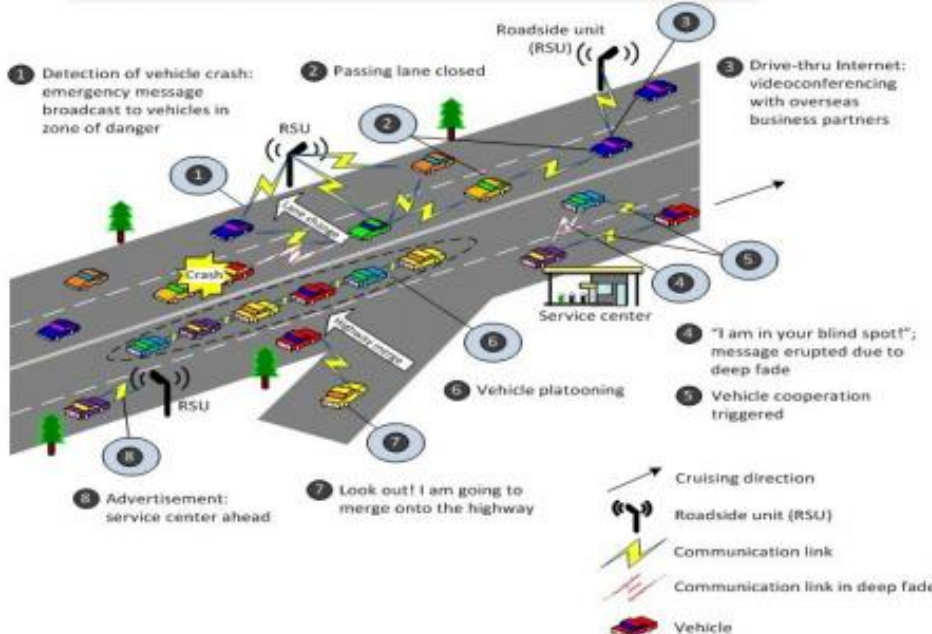


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5G - Car microwaves (3) vehicle - vehicle, thing - thing internet!



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5G – Car microwaves (4) « microwave ovens on wheels »

Cocktail of many wireless devices

+ indoor and outdoor air pollution and toxic stimuli

= very serious situation

Electrosensitive individuals seek pre-2000 models

It is very difficult to shield oneself from felt conditions

There may be a purpose for self-driving vehicles:
driving for a long haul might be too demanding
under such EMF conditions.

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5G – not safe for young rats, but *okay for humans?* **FDA**

FDA: Rats Should Limit Cell Phone Use

(Washington, DC) The results of a \$25 million study of radiation from wireless devices by the National Institutes of Health has shown "clear evidence" that laboratory rats who were exposed showed an increased risk of cancer.



Although the Sprague-Dawley rats in the study were chosen because of their distinct biological similarity to humans, the Food and Drug Administration has rushed to assure Americans that the results of this study are applicable only to rats.

"Based on these findings, we're advising rats to immediately reduce their use of cell phones, and to keep cell phones away from young rats," said a spokesman for the FDA.

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Electromagnetic fields

Suggested exposure guidelines *(for long term exposure)*

	50/60 Hz Magnetic	50/60 Hz Electric	Radio, Microwaves
Low symptom indication (except for sensitive individuals – up to 35- 50%)	0.65 milliGauss	6 Volt/metre	0.1 microWatt/cm ²
Health Issues accrue (Epidemiological studies indicates that risks for cancer and other illness may increase by 2 to 3 fold)	1.00	10	1.0
Appearances of potentially significant health problems (risk of cancers et autres illnesses increase by up to 35 X)	2.00 and more	15 and more	10 and more

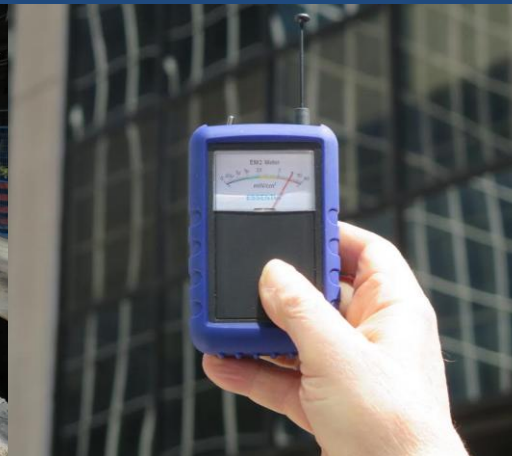
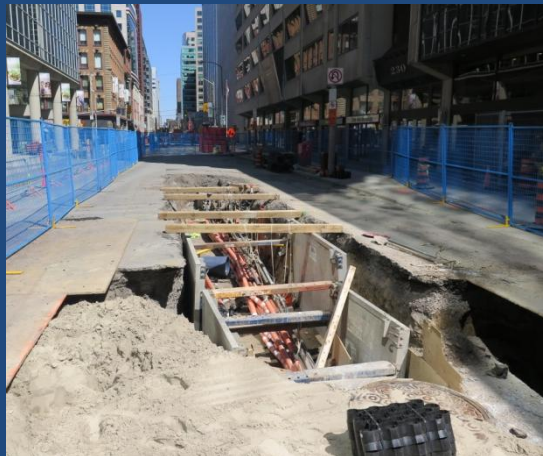
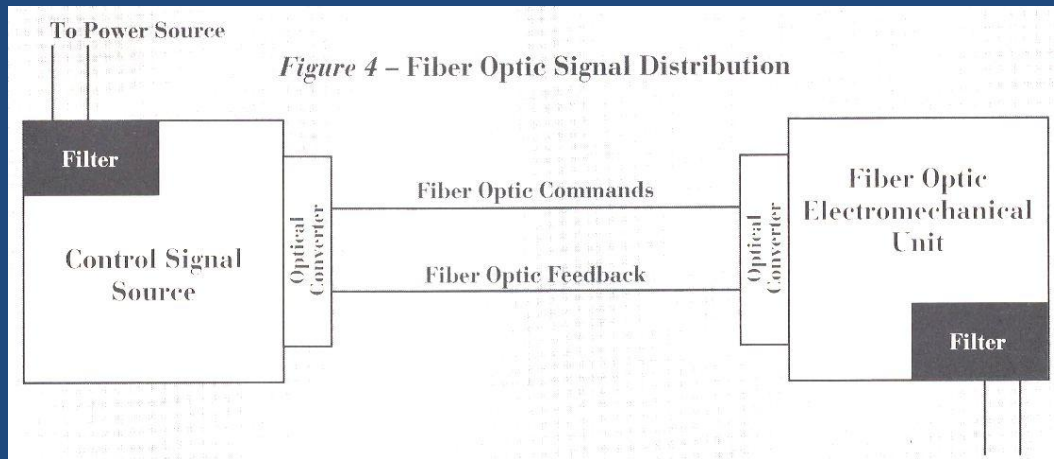
These Guidelines were first developed in 1989 by Dr. **Jerzy Kulczycki** in *Basis of electromagnetic hygiene* after a review of international medical research. Grading is based on epidemiological correlation between the incidence of cancer, leukemia and tumours in children and adults and power lines as well as effects on cell tissues subjected to power line (50 / 60Hz) frequency characteristics and to radiofrequency/microwave emissions. Update for radio & microwave spectrum effects on living cells is based on **BioInitiative** and **Resolution 1815 [2011]** of the **Council of Europe** and **Parliamentary Assembly** (assembly.coe.int)

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Fiberoptics cables – need for shielding with filters

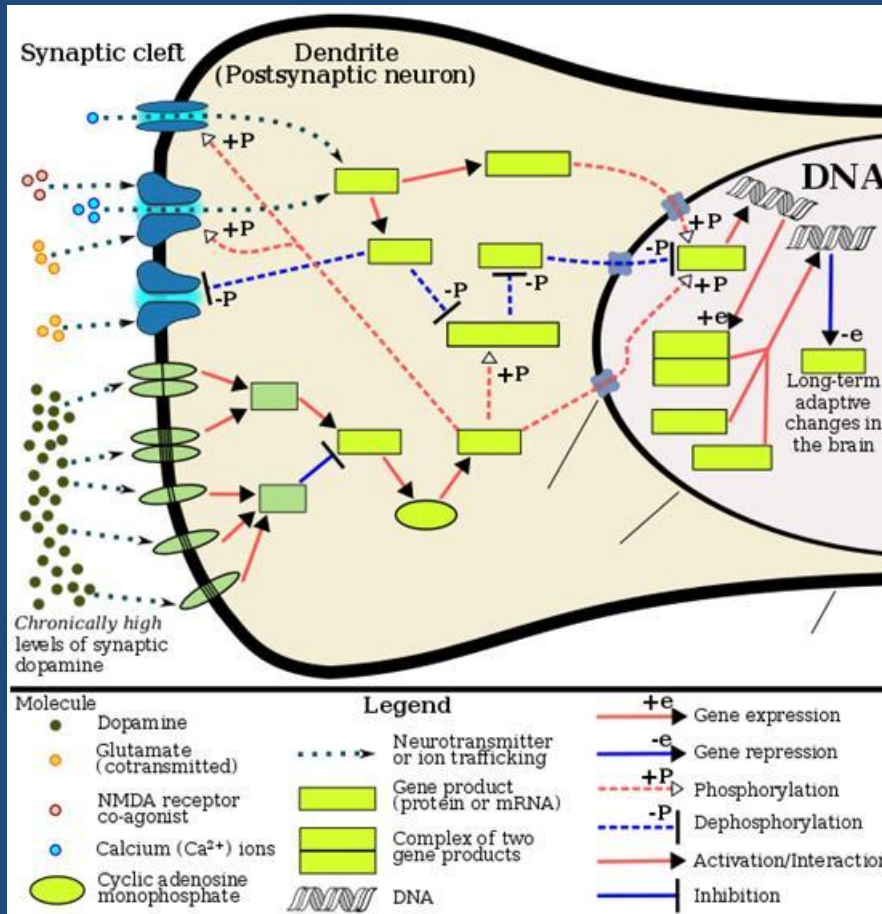


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Microwaves – direct **addiction generation**



Extremely low frequency and microwave signalling consistently transduces calcium flux (Ca²⁺) Fos series that occurs in nucleus accumbens – neurotransmitter or ion trafficking (addiction-related reward & memory circuitry) dysfunction structures

Standard model American Society of Addiction Medicine)

Addiction is a direct physical reaction to exposure to emissions which act in the same manner as morphine

Henry Lai

Wireless technology is **co-addictive** with its reward, motivation, relief protocols and applications.

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Meters: *TriField* 100XE (advanced) *TF2*, *EM2*, *Allwave* (35 GHz+)



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Relief with personal devices

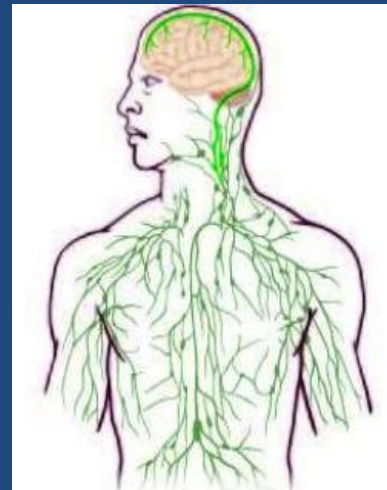
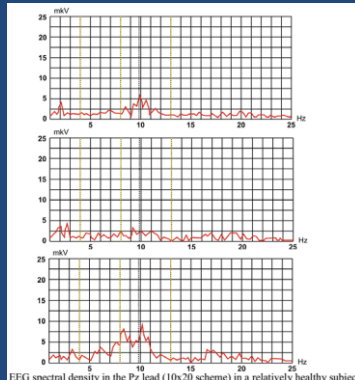
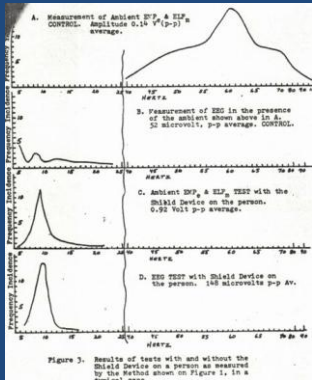
Pulsor / Purple Plates

Possible Autonomic Nervous System (ANS) regulation & Heart Variability Rate (HRV) coherence as indicators of adaptability, tonus and harmonization.

Human brain recuperates to relief from ELF and microwaves

ELF: Puharich circa 1979-81 Microwaves: Rybina 2003

Brain is part of lymphatic & ANS regulation system



Pulsor and Purple Plates

