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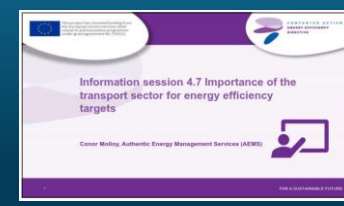
Importance of the transport sector for energy efficiency targets

20th ENERGY EFFICIENCY
COORDINATION GROUP MEETING
Vienna 18th June 2019



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Agenda

- Transport context & growth
- Our choices: Avoid, Shift, Improve
- Article 7 (EEOS) in action
- Our choices in freight
  - Article 8 Challenges
- How will you know your freight policies are working
  - Smart Freight Centre, GLEC & LEARN
- Summary

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AEMS **ECO**fleet (2005-18)

ECOfleet EnergyMAP	ECOdrive	M&V	ISO50001	EEOS-ECOfleet	Training	Smart Freight Centre
2005	2006	2010	2011	2012-16	2017	2018
Fuel Management	Training	IPMVP	Performance	Energy Audits	Transport Energy	GLEC Framework
Measurement	Feedback	ISO50015	Energy Credits	EN16247-4	ECOdrive TtT	Smart Transport Manager Training
Telematics				Trained 200+ transport energy auditors	ESOS II	Online apps for Art.7

Dún Laoghaire-Rathdown County Enterprise Board

seai SUSTAINABLE ENERGY AUTHORITY OF IRELAND

Energy Efficiency Network Europe

CLIMATE REALITY LEADERSHIP CORPS

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Context

Transport is our fastest growing emitter

What contribution does transport make in your NECP

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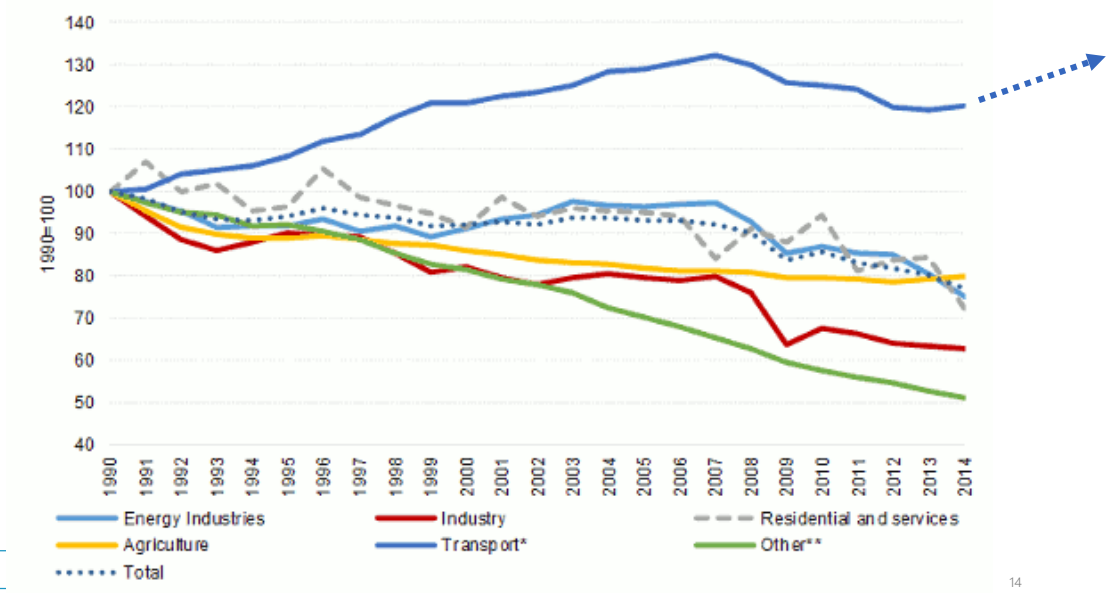
What's (not) happening with transport?



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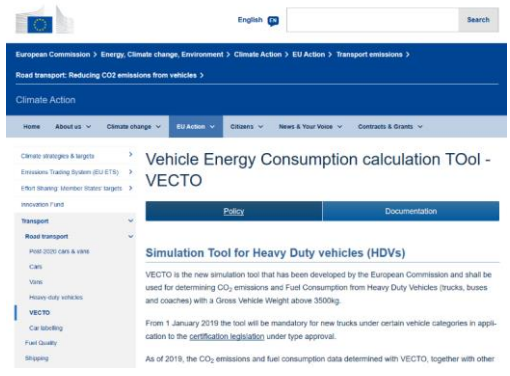
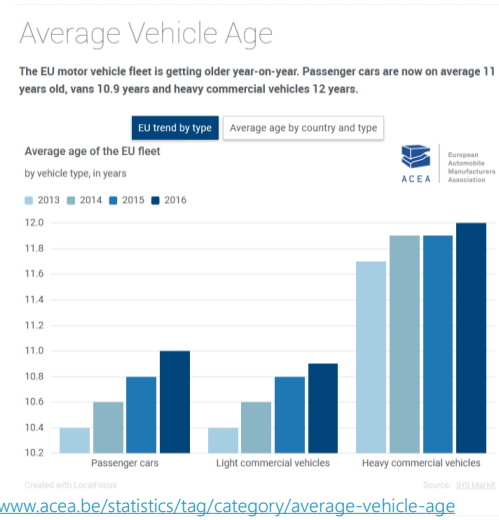
EU Road Transport – what's out there

Policy relies on new vehicle performance improvement?





https://www.acea.be/statistics/tag/category/average-vehicle-age

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Growth

Vehicle efficiency has increased due to policy measures; **what is driving emissions growth?**

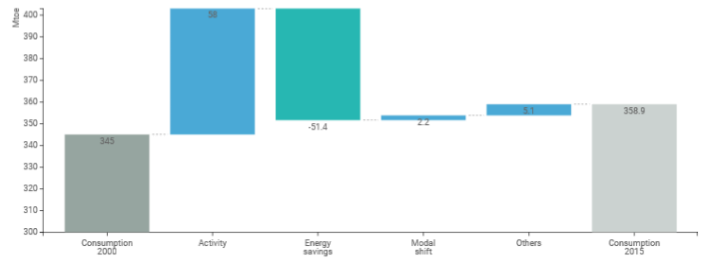
http://www.odyssee-mure.eu/publications/efficiency-by-sector/transport/drivers-consumption.html

Decomposition of energy consumption

Drivers of transport consumption

- Increasing consumption of transport since 2000 by 14 Mtoe at EU level
- Change in traffic of passenger (including air) and goods ("activity effect") contributed to increase the energy consumption (by 58 Mtoe);
- This effect was counterbalanced by energy savings (i.e. change in the efficiency of cars, trucks, airplanes etc) which tend to decrease the energy consumption.
- Few impact of modal shift, i.e. change in the share of each transport mode in the total traffic.
- Other effects (behavioral effects and "negative savings" in freight transport due to low capacity utilization) tend to slightly increase the energy consumption.

Drivers of energy consumption variation in transport at EU level



Energy use in freight

Slight increase 2000-2015 due to:

+17mtoe GDP growth

+2mtoe shift to road

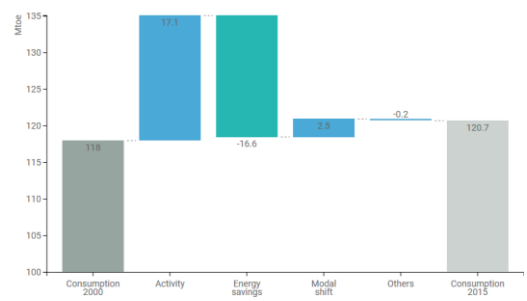
-17mtoe due to energy savings

http://www.odyssee-mure.eu/publications/efficiency-by-sector/transport/drivers-goods-energy-consumption-variation.html

DRIVERS OF GOODS ENERGY CONSUMPTION VARIATION (EU)

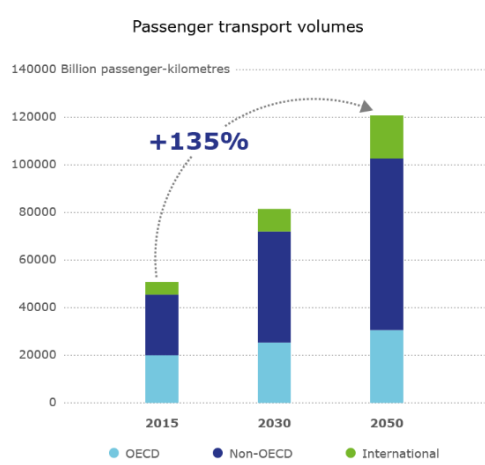
The energy consumption of freight transport slightly increased between 2000 and 2015. This is the result of two opposite trends: the of increase in traffic in ton-km and, to a lesser extent, modal shift to road transport have contributed to raise consumption (by 17 and 2 Mtoe, respectively), while energy savings have decreased consumption by 17 Mtoe.

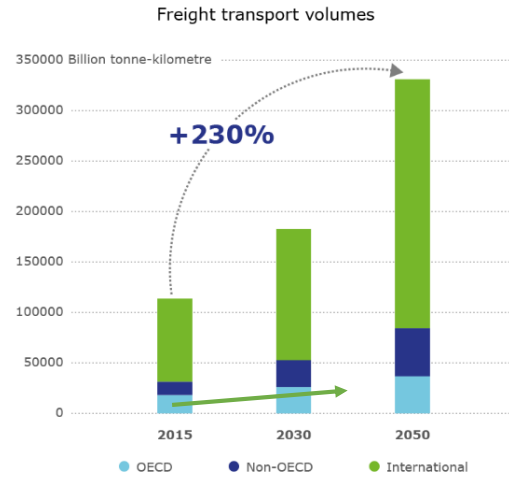
Decomposition of energy consumption for freight (EU)



ITF Outlook to 2050

Published 2017, update due May 2019





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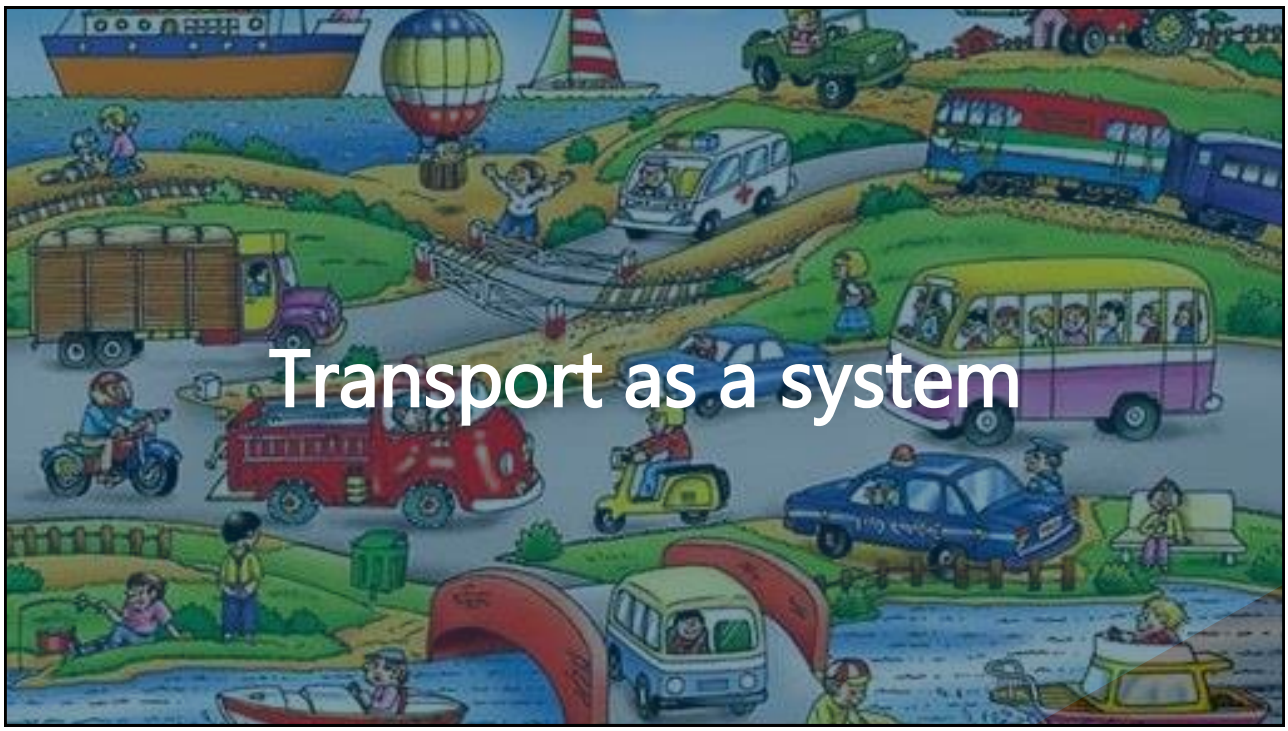

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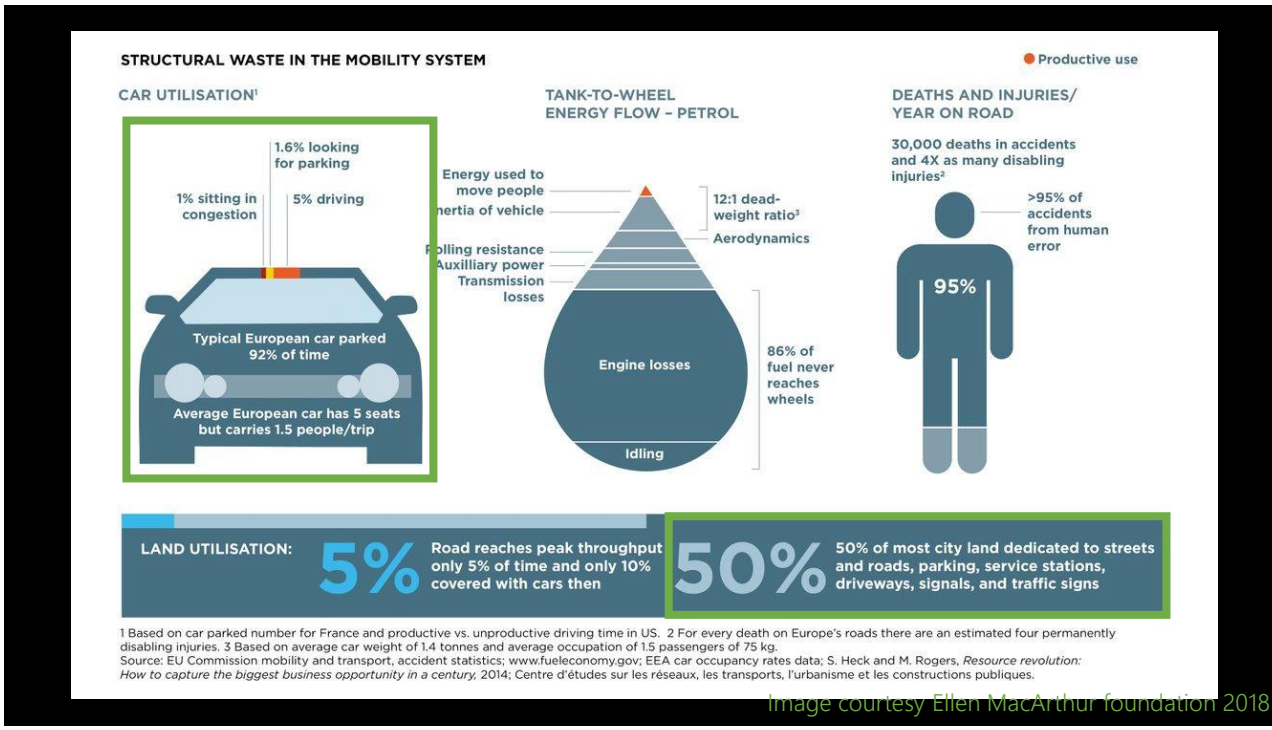

Image courtesy Ellen MacArthur foundation 2018

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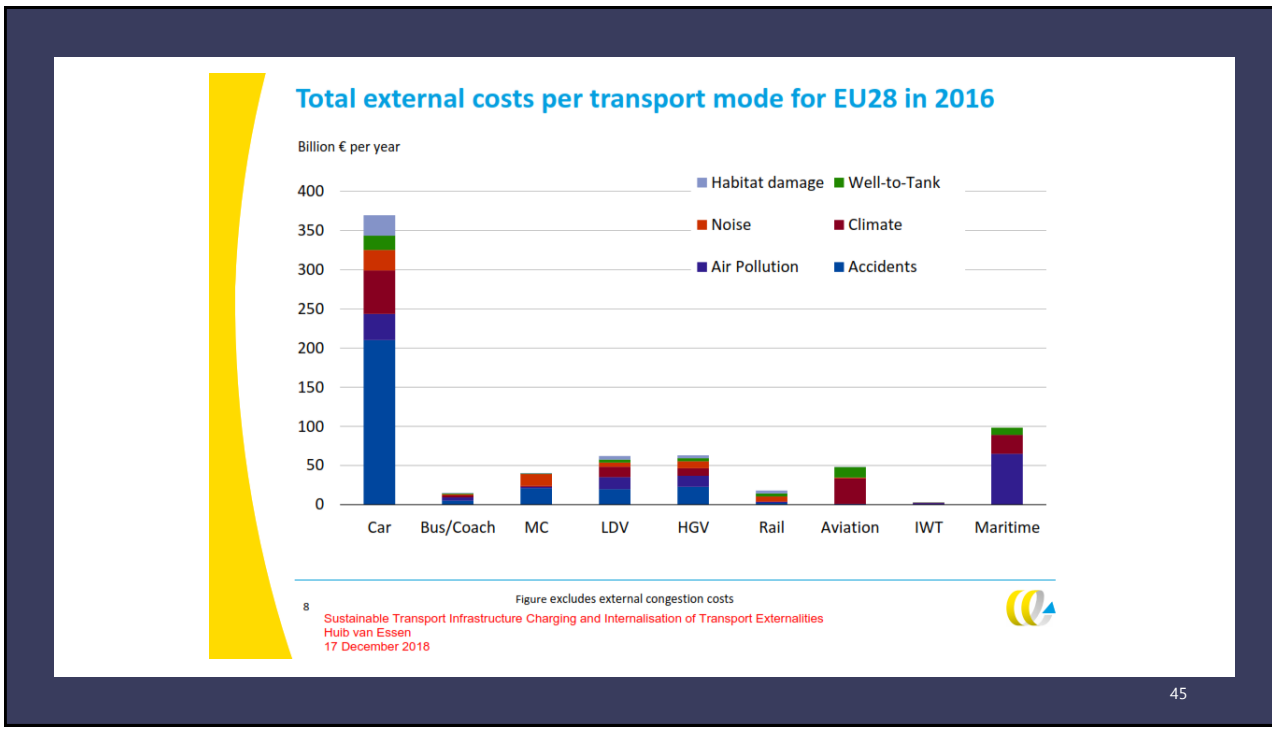

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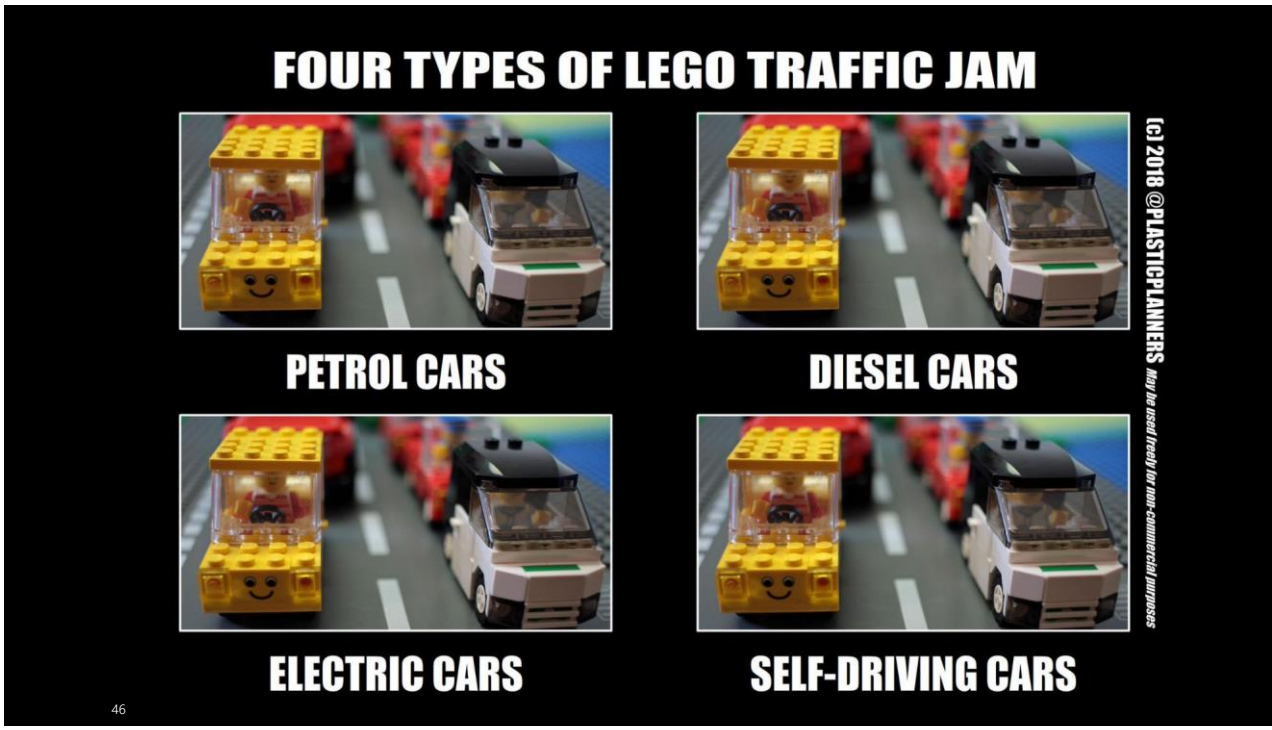
FOUR TYPES OF LEGO TRAFFIC JAM
PETROL CARS
DIESEL CARS
ELECTRIC CARS
SELF-DRIVING CARS
(c) 2018 @PLASTICPLANNERS May be used freely for non-commercial purposes
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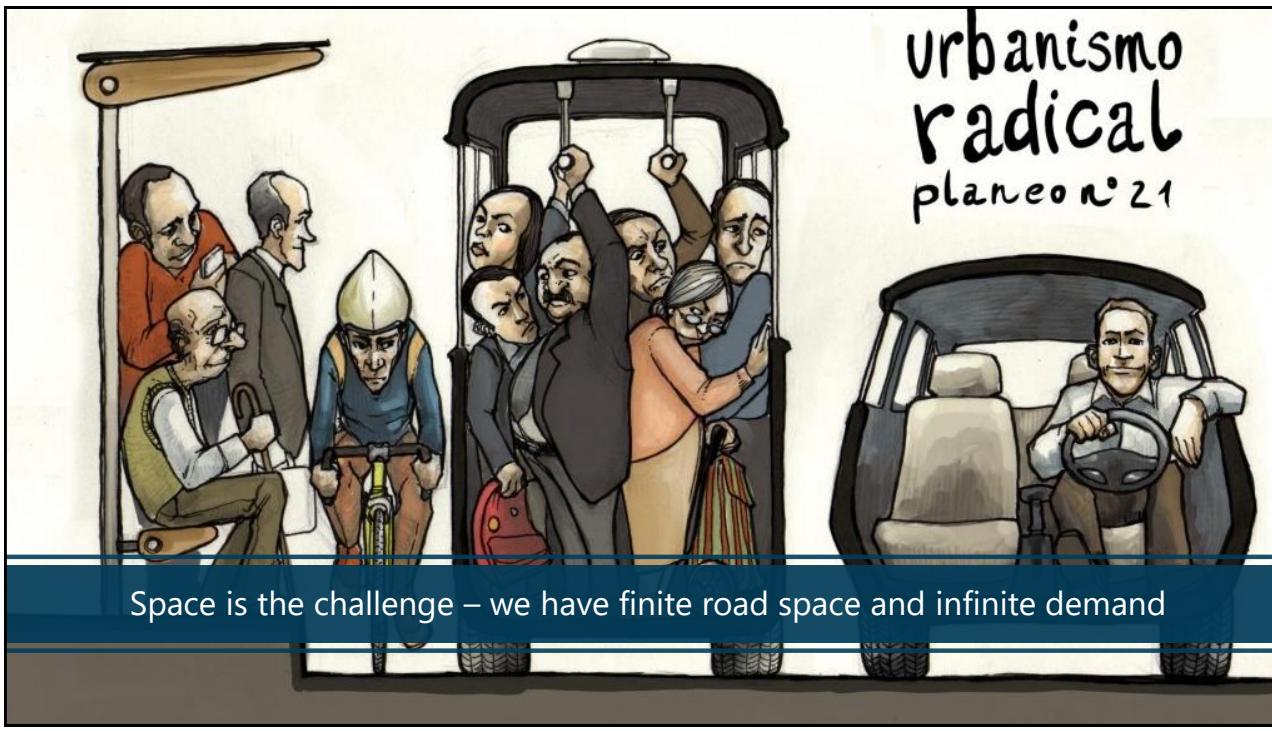
urbanismo
radical
planeo nº 21
Space is the challenge – we have finite road space and infinite demand

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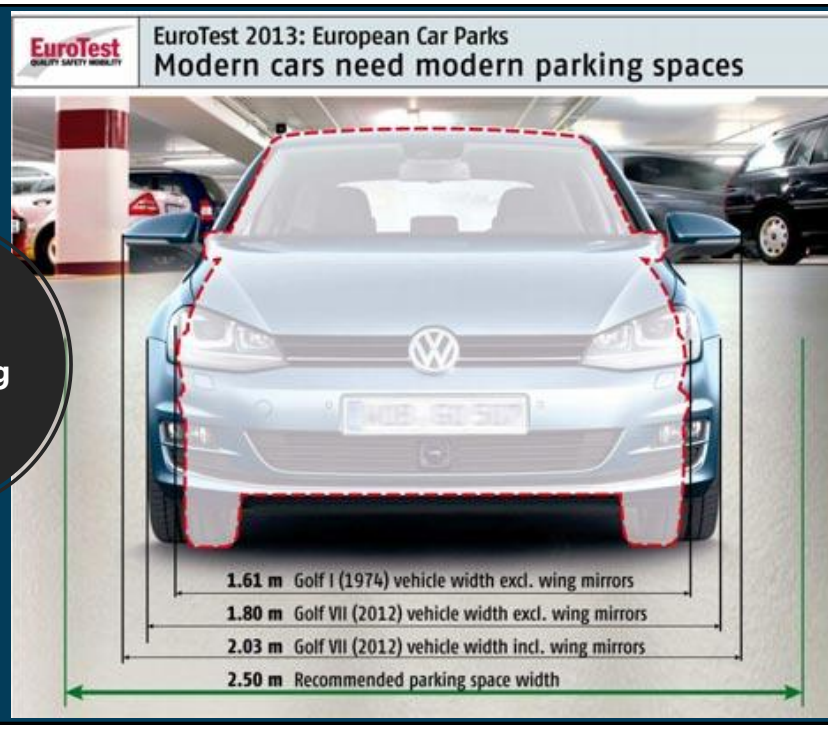
Cars just keep getting bigger



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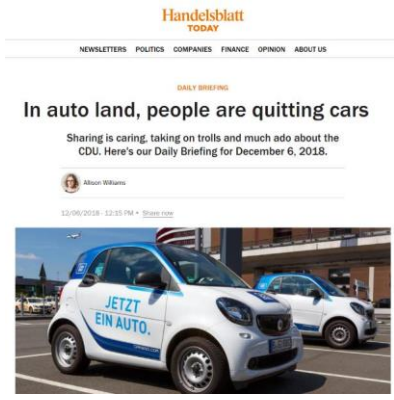
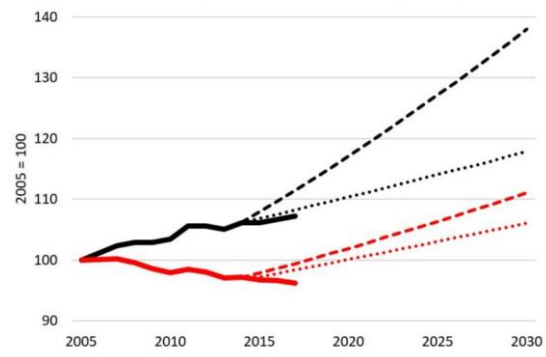
Will car culture shift from 'me' to 'we'*?

Under 30's are driving less . . .



Netherlands 2016 actual car use v forecast

https://ariebleijenberg.nl/en/car-mobility-decreases-in-the-netherlands/ Arie Bleijenberg



*Allison+Partners report suggests a shift from car culture to mobility culture 14 March 2019 https://www.greencarcongress.com/2019/03/201903214-ap.html

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A strategic approach

Avoid
Shift
Improve

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What can we do? A strategic approach (ITF, UN, IEA et al)

Strategy & policy framework

1. Avoid travel	2. Shift mode	3. Improve performance
System efficiency	Trip efficiency	Vehicle efficiency

EED 2012 Art.7 and Art.8

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1. Avoid travel

Do you need to travel?
Is there an alternate?
Are we planning?

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Who remembers the London Olympics traffic jams?

No-one – they didn't happen due to excellent travel planning.

Travel decision tree principles, the 5R's

- Rethink
- Reduce
- Re-mode
- Reroute
- Retime

Courtesy CILT International

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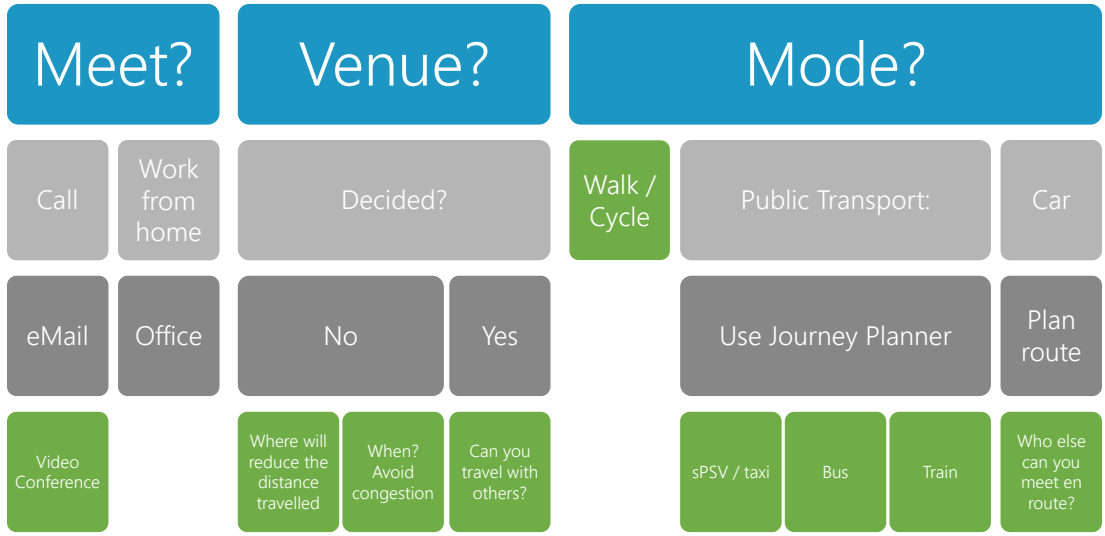
Workplace travel planner (WTP made simple)



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Avoiding freight: What do we ship most? Air!

Ikea promotional Easter egg 2019

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2. Shift mode

What are your options?
How Public Transport can sell itself

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14/06/2019

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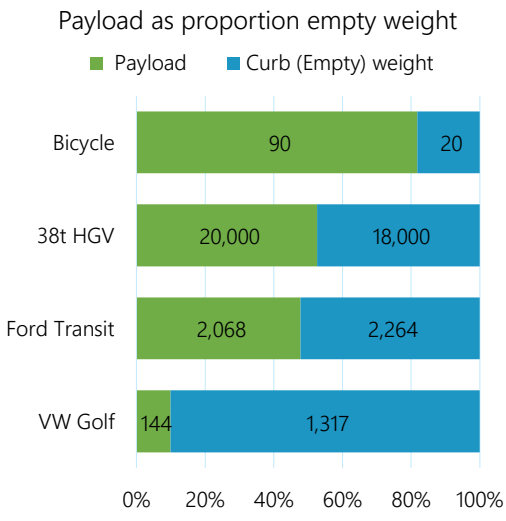
Capacity vs use



What is your car utilisation?

- 4 seat car with one driver = 25%
- Used for 2 hrs/day = 8% (EU Average)

What is empty weight vs payload?

- When did you last empty your boot?
- How often do you plan your route?

Vans vs Artics (HDVs)

- 2t vs 20t, 10 vans vs 1 truck?

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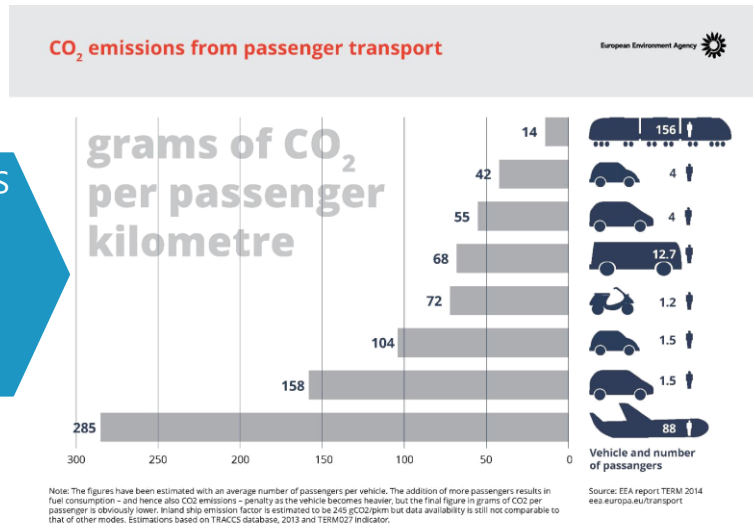
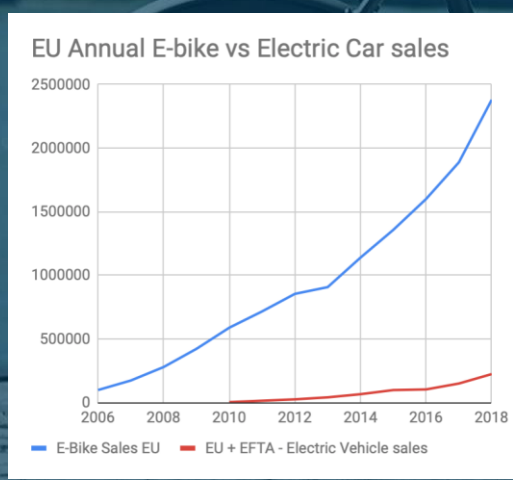
Which modes are missing from this graphic?



All are EVs, but which will reduce emissions the fastest?

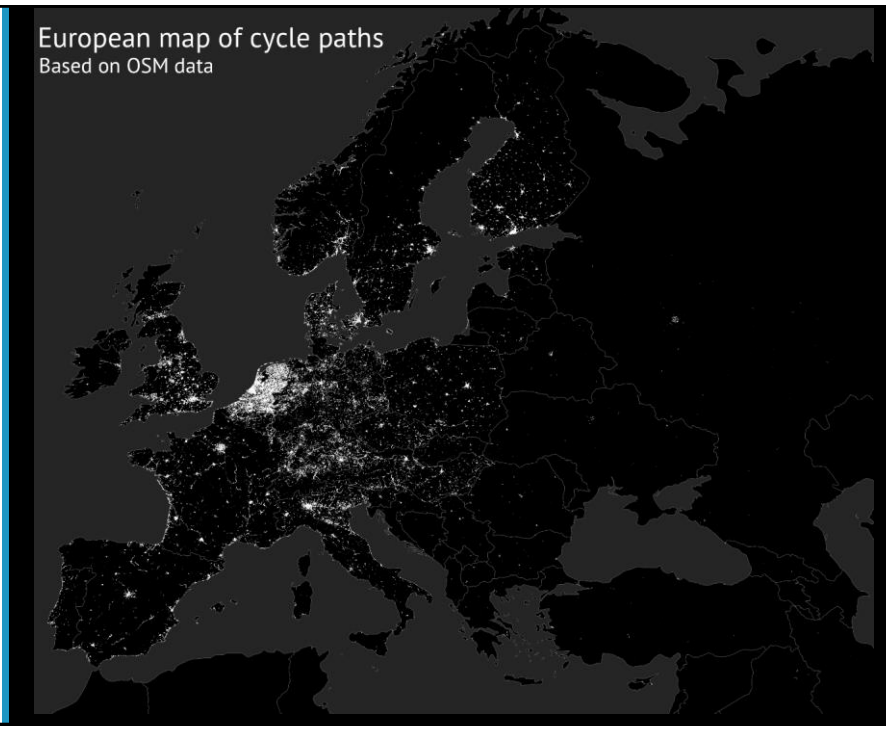


Source : Oliver Bruce @oliverbruce

EU Cycle Paths

Where are we ?

Where is this in your SEAP / SUMP?



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Where do we cycle?

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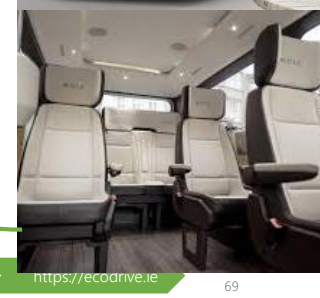
Will car culture shift from "me" to "we"?



eTaxi, eBus or **Shared eTaxi?**
Shared taxis can **reduce road space requirements by 92%** - ITF in Lisbon, Helsinki . . . so far

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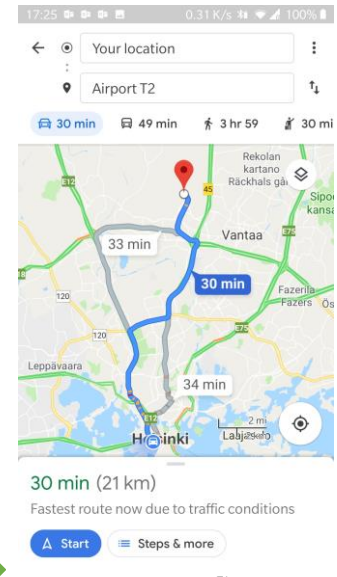
Shift exercise: use a Journey Planner

How did you get here today?

1. What alternatives are there?
   - Use your hotel/home address to here
2. Work out your costs
   - Compare to cost per km of your car (use 67c/km - AA Ireland)
3. Work out your time
   - Can you work while driving?



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Company cars vs modal shift

If your company car tax plateaus at 30,000km per year

- How many km will you drive per year?

You receive expenses per km; will you use public transport?

- What needs to change?

You bussed / walked / biked to work

- How do you go to a meeting during the day?

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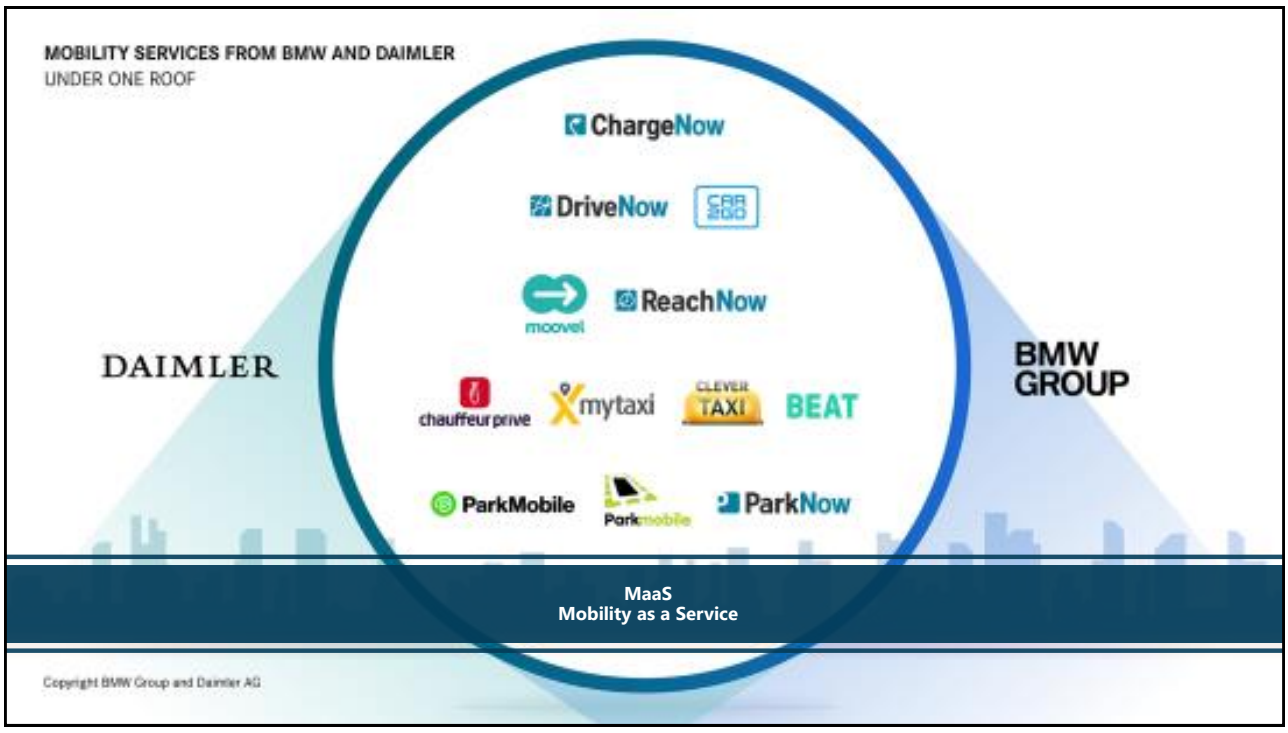

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3. Improve performance

Improve the fuel and emissions performance of your existing vehicle(s)

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Why should **you** manage fuel

Business case	Example	Your figures
Energy / fuel spend (approx.)	€ 1,000,000	
Typical/projected savings	10%	
Potential saving over 3 years	€ 100,000	
Potential saving over 1 year	**€ 33,000**	
Profit (or non-pay budget) last year? Say 3% of €3m t/o	€ 90,000	
Savings **as % of profit or budget** per year	37%	
Sales or work needed to make same profit	€ 1,100,000	

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Slow down, save money, CO_2 and lives

6.5L/100km @ 120kph

3.1L/100km @ 100kph

Always obey speed limits: Typical saving 25% (120-100kph); limit yourself to 110kph to add 100km per tank.
Based on my experience in Ireland over 60,000km in 141 VW Golf 1.6tdi averaging 800km per tank normally.

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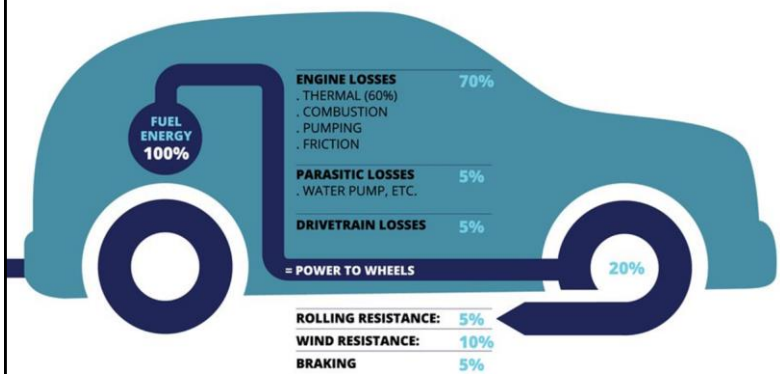

(1) The drivetrain of a motor vehicle is the group of components that deliver power to the driving wheels. This includes the transmission, the axles and the wheels.

Adapted from: https://www.fueleconomy.gov/feg/atv.shtml

70%

of your fuel cost is wasted in heat and exhaust

20%

Moves you around

ICE Losses - EU EEA 2016

How much do you spend on fuel per week? €50 x 50 wks = € 2,500/yr i.e. € 2,000 is wasted to heat

81

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Working EV vs diesel

Diesel @ 4.9L or 49kWh/100km

EV @ 15kWh/100km

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Your experience with transport in EEOS

From your Art.8 Energy Audits:

- How many EV's procured to date?
- How much energy have you saved?
- What are the barriers?

How many energy credits do your Art.7 schemes (EEOS) give to:

- Avoiding travel?
- Consolidating deliveries?
- Modal shift
  - from car to public transport?
  - From car to bicycle / walking
- Diesel to Electric replacement?

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Mobility Lessons EEOS; 2012 to date

Article 7 and Article 8 to 2030

Avoid travel	Shift mode	Improve performance
Recognise working from home and video conferencing	Recognise savings from switching car to train & bus	Recognise diesel to EV savings as **final energy**
Identify opportunities to save in Energy Audits	**Pay expenses at same rate** regardless of mode	Educate public and government as to where waste lies – **inform choices**

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Freight in EEOS (Art.7)

ECOfleet™ programme funded by Enprova (95% of oil industry in Ireland)
Funded under EEOS – Art.7 of EED 2012 in action
80 fleets engaged 2012-2019
Approx. 5,000+ vehicles & drivers

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Save fuel: get paid

CEO → Fleet Manager → Fuel Management → Quarterly Report: Enprova Funding

Allocate time ← →

Keep records ← →

Feedback Weekly ← →

1. Business Case → 2. Opportunities → 3. Action Plan → Vehicles, Drivers, Scheduling, Routes

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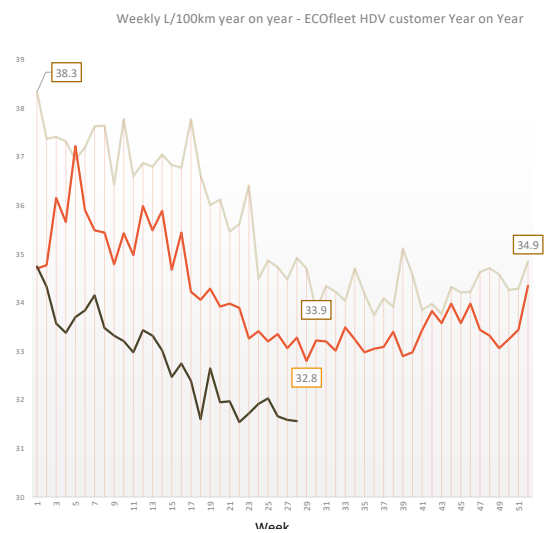
What can one business or fleet do?

- Fuel Management
- Weekly Driver Feedback
- ECOdrive training
- Aerodynamics retrofit
- Speed limiters reduced
- Detail Maintenance (batteries, tyres, oils)
- Buy new vehicles



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Example Payments under EEOS (Art.7)

Total paid out:	€100,389
Smallest payment:	€1,035
Largest Payment:	€16,718
Average Payment:	€7,700
Total Litres Saved:	**2,641,789L**

Smallest fuel saving to one company was 16,000L and largest monetary saving to another company was €498,000.

Public Sector fleets have received payments and benefits in kind e.g railways received telematics hardware and software services

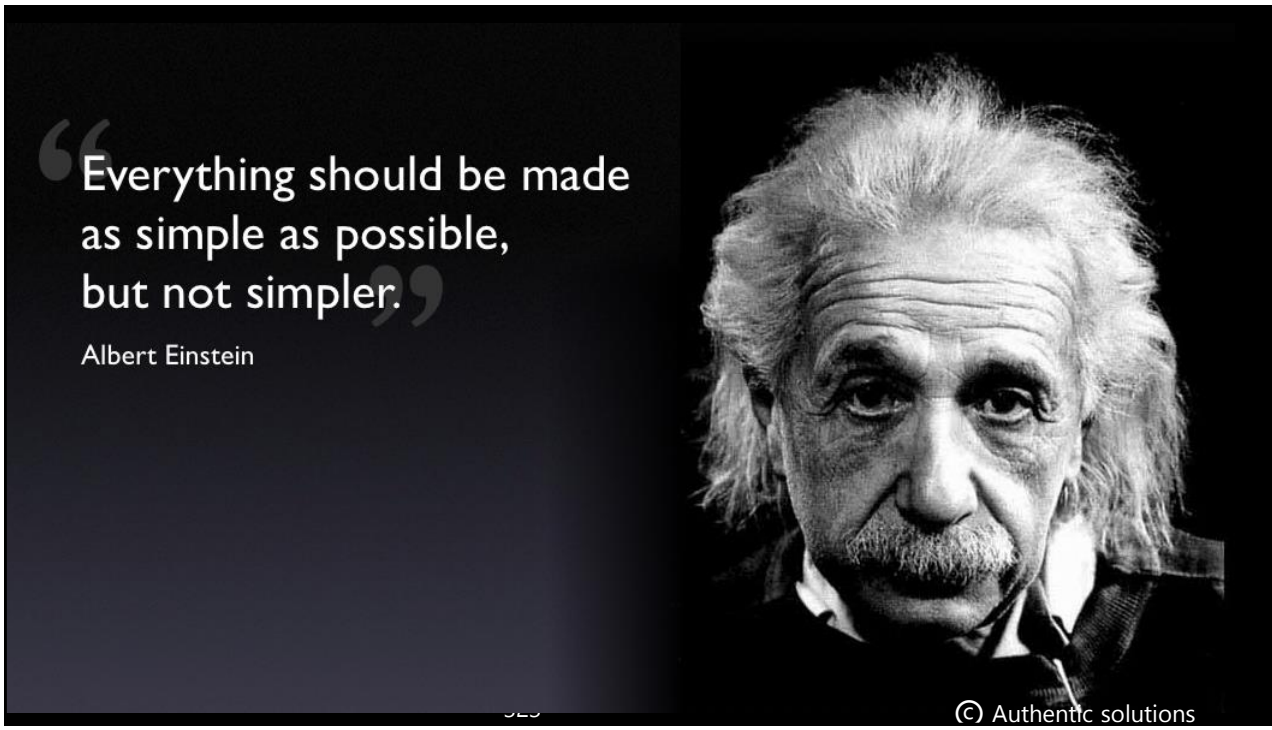
Annual Performance Certificate

GLEC Declaration planned for 2019

- Can be funded as part of EED 2012 Art.7 Enprova funded ECOfleet

Designed to show how well you are managing fuel and CO_2e emissions

- Without revealing commercially sensitive information
- Can be used to engage 3rd party hauliers
- Can be used to secure business by hauliers



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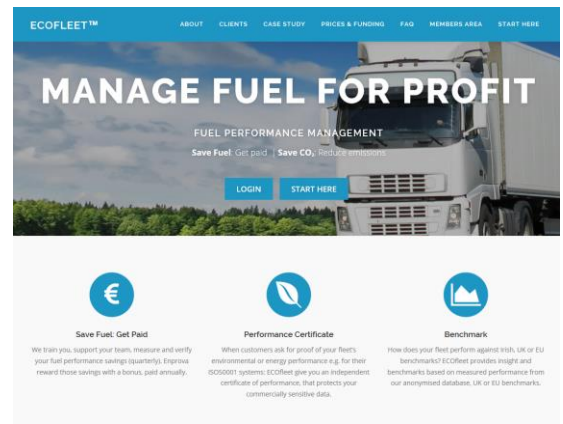
Art.7 EEOS platform https://ECOfleet.ie

5 Step programme

1. Business case
2. Where are you
3. Opportunity score

   Self service fleet audit (voluntary)
4. Action plan
5. M&V

Ready to go online app



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The EU freight challenge

All families, businesses and state services rely on road freight to sustain themselves.

Trucks move **14 billion tonnes** of goods per year.

They deliver some 72% of all land-based freight in Europe, or **90% of the total value** of goods, while accounting for **5% of total CO_2 emissions**.

The performance of road freight transport, measured in billion tonne-kilometres, has **increased by as much as 20% between 2000 and 2016**.

ACEA Oct'18

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Europe's road freight sector

70+% of all goods movements are by road.

EU Emissions:

- 15% from light-duty vehicles (cars and vans)
- 6% from Heavy-duty vehicles (trucks and buses)

New EU vehicle efficiency rules and targets will help, **but not if trucks are running empty**!

https://ec.europa.eu/clima/policies/transport/vehicles/heavy_en

How many of Europe's **540,000 SME transport operators** have been subject Art.8 audits?

How many have benefited from EEOS (Art.7)?

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Sustainable consumption?

Goods volumes set to treble to 2050?

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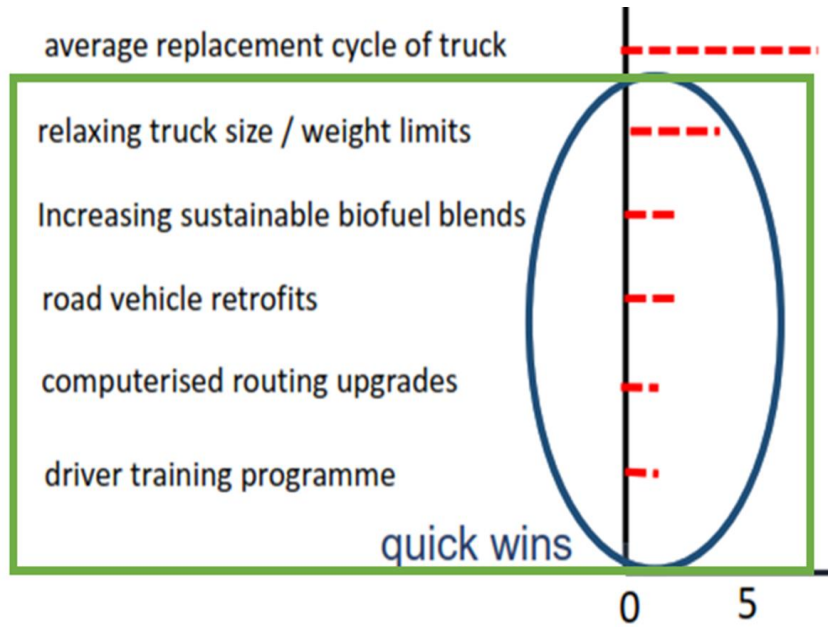
Quick wins in freight

Prof Alan McKinnon – LEARN Project 6-7th February 2019



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What will EU freight solutions look like?

Double length / 'duo' trailer, tightly packed delivering once daily to your local shop or parcel motel?

Or energy intensive drones delivering to your door

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How will you know your freight policy is working?

Policy change; relaxing truck size & weight limits
Grant or tax breaks for new more efficient trucks
Behavioural changes in ecodriving and collaboration

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Freight and logistics: the orphan of sustainability

- Freight and logistics delivers goods to millions of customers around the world
- Freight demand is expected to triple by 2050
- The sector accounts for 8% of global greenhouse gas emissions today and growing
- Freight is a major contributor to air pollution, noise and congestion
- We cannot meet our climate and sustainability goals without efforts in this sector

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Freight and logistics is not high enough on the sustainability agenda of government and business

Smart Freight Centre

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Yet, solutions already exist for many stakeholders, sectors, countries

REDUCE FREIGHT TRANSPORT DEMAND
- supply chain restructuring
- Standardized modules/boxes
- 3D printing
- Dematerialization
- Consumer behavior

OPTIMIZE FREIGHT TRANSPORT MODES
- Modal shift
- Multi-modal optimization
- Synchromodality

INCREASE ASSET UTILIZATION
- Load optimization
- Load consolidation and asset sharing
- Logistics centers and warehouse management

IMPROVE FLEET ENERGY EFFICIENCY
- Cleaner and efficient technologies
- Efficient vehicles and vessels
- Driving behavior
- Fleet operation
- Fleet maintenance

REDUCE CARBON CONTENT OF ENERGY
- Cleaner and lower-carbon fuels
- Electrification
- Fuel management

- These solutions combined can reduce emissions by >80% by 2050

Smart Freight Centre. Solutions based on Alan McKinnon 'Decarbonizing Logistics' 2018

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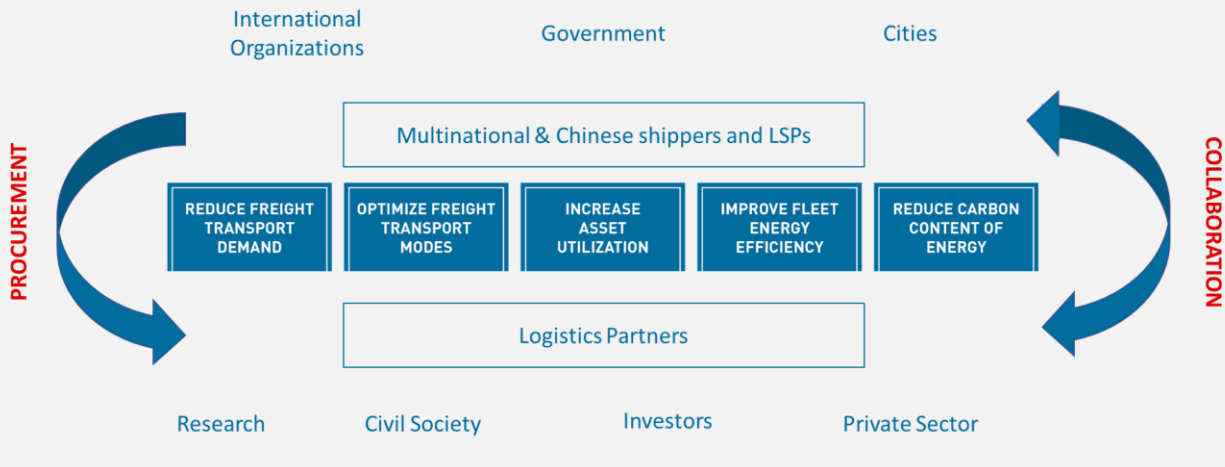
The key to emission reduction lies with business and collaboration across stakeholder groups

Smart Freight Centre



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Smart Freight Centre

Businesses can't see the wood for the trees in initiatives… and the sector is fragmented

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Smart Freight Centre

Smart Freight Centre

- Global NGO dedicated to freight: bring together and work with the global logistics community towards an efficient and zero-emissions global freight and logistics sector
- Our goal: 100+ multinationals reduce at least 30% of logistics emissions by 2030 compared to 2015 across their global logistics supply chains and decarbonize by 2050.
- Society benefits: greater contribution from the logistics sector to Paris Climate Agreement and SDGs

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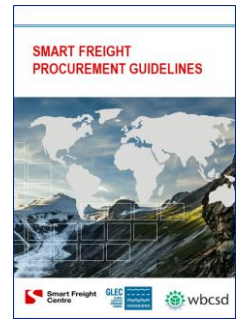
How we work: provide guidelines and approaches for industry to calculate, report and reduce emissions

Smart Freight Centre

- Calculating & reporting emissions ("GLEC Framework")
- Setting emission reduction targets
- Buying freight services
- Managing truck fleets



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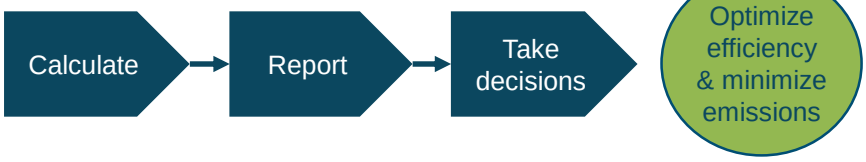
The LEARN Project (2016-2019) www.learnproject.net

Mobilize businesses to reduce their carbon footprint across their global logistics supply chains through improved emissions calculation and reporting



LEARN partners

Smart Freight Centre, CLECAT, connekt, DLR, energy saving trust, ESC, Fraunhofer IML, RJ PROJECTS, ivl, NTM, TNO innovation for life, UNTRR, ZLC, MIT GLOBAL SCALE NETWORK

This project has received funding from the European Union's Horizon 2020 research and innovation program under grant agreement No 723984.

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Four "Asks" and LEARN outputs to help

- Businesses: calculate logistics emissions using the GLEC Framework
- Businesses: report more consistent and reliable logistics emissions data
- Governments & research institutes: support business
- All stakeholders: join our growing network to help businesses be leaders

1. Guide for GHG accounting at logistics sites as part of GLEC Framework
2. Calculation tools info sheets
3. GLEC Framework challenge cases & company examples
4. Training course on emissions accounting
5. GLEC Declaration for external reporting
6. Research Agenda
7. **Policy Recommendations & input into ISO standard development**
8. Growing LEARN network & annual workshop to continue

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Policy recommendations to promote logistics emissions accounting and use of results

Methodology development
- Back GLEC Framework and support ISO development & EN16258 update
- Back single global set of fuel emission factors, including alternative fuels
- Support awareness and information campaigns for industry

Data collection and exchange
- Back IMO/IATA protocols & alignment
- Support development of global (or EU) data exchange protocol(s)
- Explore development of neutral platform & IT architecture with TMS link
- Take more central role in data exchange

Assurance
- Give companies incentives to collect high quality data and obtain assurance
- Explore assurance needs in case of mandatory report or carbon pricing
- Support standardized assurance guidance and reporting template

Use of results
- Establish national Green Freight Program
- Make gov't targets relevant to the sector
- Support industry surveys & recognition
- Include in NDCs/nat'l/city plans: infrastructure, vehicles/vessels and their operation

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Global Logistics Emissions Council

An industry-led collaboration to establish and implement harmonized, transparent frameworks for calculating, reporting and reducing logistics emissions.

Companies	Members	MAERSK, DB SCHENKER, DHL, Dow, efl, GES, GEODIS, Hapag-Lloyd, Hewlett Packard Enterprise, KUEHNE + NAGEL, DSV, SNCF, STEF, VOLKSWAGEN
	Consultees	BNSF Railway, Dearman, ERG, Ewals Cargo Care, HEINEKEN, H&M, INTERPORTO BOLOGNA, KOTAHI, ups, Unilever
Programs	Members	BSR, clean CARGO, GREEN FREIGHT ASIA, LEAN & GREEN, NTM, PLVB
	Consultees	ADEME, Arola, EcoTransIT, ITENE, ivl, RIGHTSHIP, TRUCKBLUE, Via Green
Associations	Members	CLECAT, ebu, ESC, FEPORT, FIA, IATA, IRU, UPU Universal Postal Union
	Consultees	AC, EE, cefic, Centro de Logística & Sustentabilidad Argentina, ECTA, IAPH, ICHCA International, TRANSFICIENT
Organizations & Experts	Consultees	energy saving trust, Fraunhofer IML, icct, STC-NESTRA, World Resources Institute, SCOPE3, ADVANTIKA
	Experts	Buddy Polovick (US SmartWay), Colin Smith (EST), Jens Froese (Jacobs University), Kerstin Dobers (Fraunhofer IML), Marc Cottignies (ADEME)

This project has received funding from the E

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Recommendation to government: Back GLEC Framework and support ISO development & EN16258 update

Smart Freight Centre

GLEC Framework: the universal method to calculate emissions consistently across the global logistics supply chain

Compatible with BUILT ON GHG PROTOCOL

Recommended by CDP DISCLOSURE INSIGHT ACTION; SCIENCE BASED TARGETS

Adopted by **30+ companies**

Endorsed by CLIMATE & CLEAN AIR COALITION; globalgreenfreight.org

Incorporated in guidelines of industry associations, green freight programs and calculation tools

Plans to develop/update standards based on GLEC Framework ISO; CEN

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Picking the right KPI for freight transport energy efficiency

Smart Freight Centre

L/100km is a good starting point, but a weak indicator of overall freight efficiency;

- Doesn't include load factor which is a key element of freight efficiency programs
- Doesn't differentiate between **loaded** and **empty** km
  - In fact empty km give you a better l/100km figure!
- Doesn't tell you if you have efficient routing or not.
- However L/100km can help to gather the data needed to support Litre per Tonne.km

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Integrating into harmonized data collection protocols

Smart Freight Centre

Steps towards common data collection architecture:

- Agree on common KPI: fuel consumption (and emissions) per tonne-km as per GLEC Framework & international freight statistics
- Develop data collection and interoperability standards
- API development
- Mutual recognition of national data platforms (for international operations)

- Integrated energy efficiency & freight transport GHG reporting
- **Supported by a consistent approach to reporting across countries when implementing EED, Article 7**
  - Start with L/100km progress to L/Tonne.km

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Join our journey towards efficient and zero-emissions freight

Smart Freight Centre

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Summary

Authentic ENERGY MANAGEMENT SERVICES

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What are your EnMS actions from today?

Reduce car use = reduce congestion for goods & public transport	
Review freight operations / supply chain	
Use Art.7 to incentivise Green Freight programmes	Recognise savings from EV's Recognise gains in L/100km and L/tonne.km; Consolidation, reduce empty running
Start with the basics	Educate Avoid Shift Improve Smart Freight offers GLEC to show savings ECOdrive train professional drivers

Manage energy for profit & planet © www.aems.ie https://ecofleet.ie https://ecodrive.ie

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Thank you!

Show of hands, how many . .

Want to meet again on transport?

A Will work from home more often?

S Consider alternate modes?

I Slow down on the way home?

www.aems.ie
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conor@aems.ie
@conormolloy

Next Smart Transport Manager Training STMT end June Dublin