



Kapsch TrafficCom



# MBUFA National Conference

*Case Study: Norway*

24<sup>th</sup> October 2023, Washington

# Evolution of the national toll system AutoPASS

## ***Norway is pioneer in road tolling***

- The world's first urban toll system in Bergen in 1986
- The world's first fully automatic toll system in 1987

## ***AutoPASS - national system for collecting tolls***

- Today approx. 340 fully automatic toll stations across approx. 900 km of roads

## ***Multi-lane free flow Tolling***

- The toll stations operate in multi-lane free flow mode, and the vehicles are identified through CEN-DSRC on-board units and automatic read of the license plates

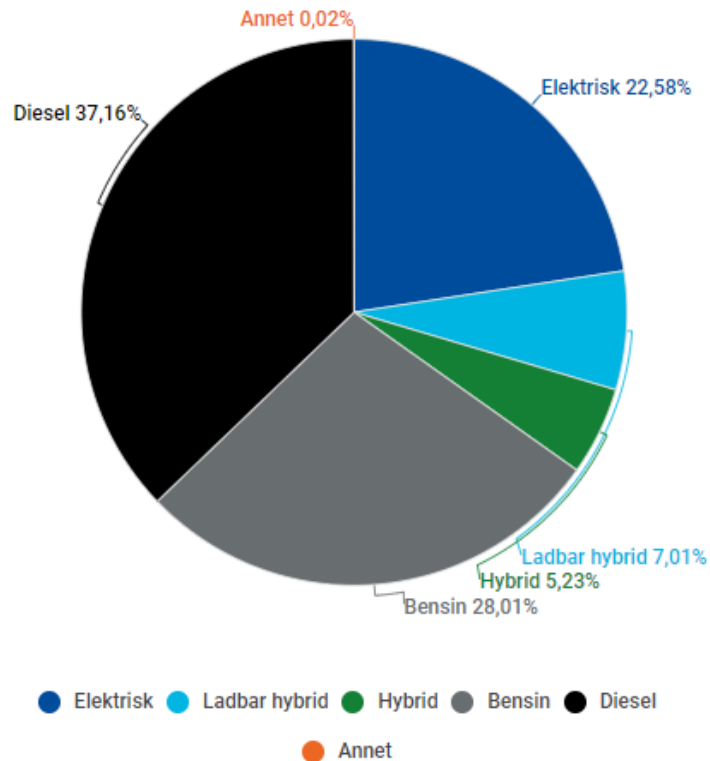
## ***Objective of Road Tolling in Norway***

- Faster development of road infrastructure, strengthen public transport & reduce the environmental impact.

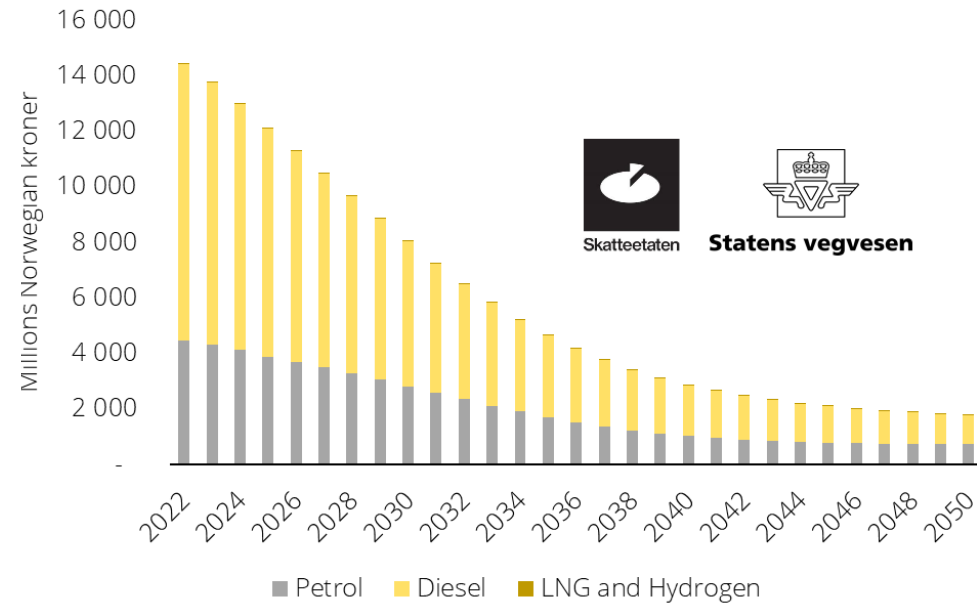


# Acute reform of road funding is needed in Norway: 30% of vehicles are now electric

Share of light vehicles on the road by type (August 2023)



Central government fuel excise receipts (actual + forecast)



- Norway is the world's most Electric Vehicle (EV)-friendly car market
- Government policies to adopt EVs has had an adverse effect on fuel tax, sales tax, toll and ferry receipts
- A more sustainable solution is required to retain the lost contribution from fuel tax and vehicle sales tax

# The finance and transport ministries conducted a concept selection study, where four options were considered

## ***The Null Option***

- Fuel taxes remain as they are
- Existing toll rate discounts for EVs remain
- EVs pay no additional road usage charges

## ***A KM-Based Road Use Tax for EVs Only***

- Only applies to zero emissions vehicles
- Fixed rate for all kilometres travelled regardless of location
- Flexible reporting methods allowing gradual transition from manual to automatic means
- Equal road toll rates for all vehicles
- Fossil fuel cars continue to pay taxes and fuel excise as they do today

## ***Variable distance pricing based on place only***

- Two price model with different pricing for urban and non-urban kilometres travelled
- Applies to all vehicles
- Technology solution not finalised, but could include basic calculation based on geozones and/or use of the existing (DSRC) toll system

## ***Variable distance pricing based on time, place & vehicle type***

- Creation of multiple charging zones including rural, city and large city
- Inclusion of external costs in the price tariff relating to congestion, noise, pollution etc.
- Use of vehicle location data from a range of devices
- Applies to all vehicles

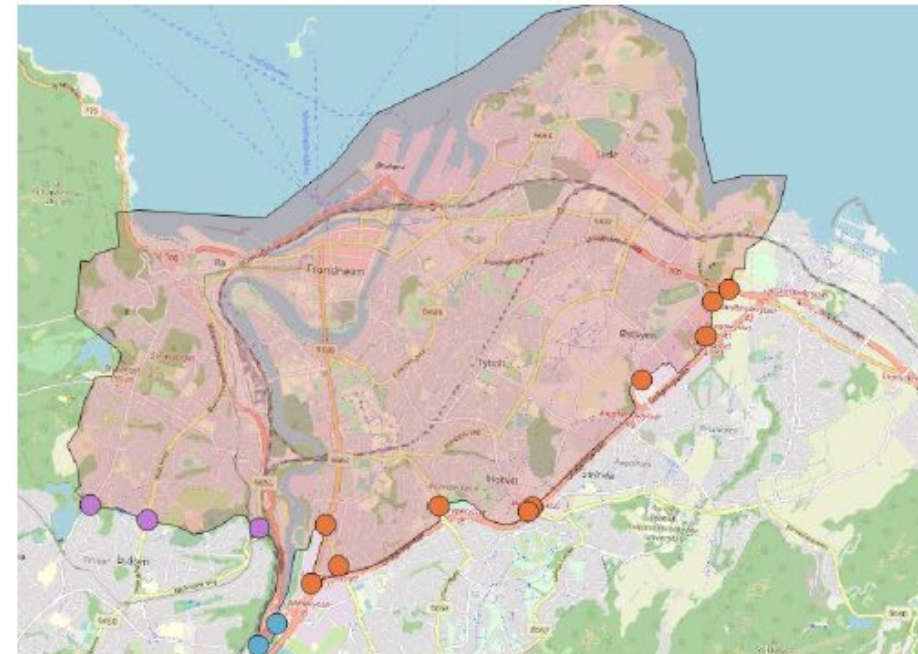
**The finance and transport ministries conducted a concept selection study, where four options were considered**

**Individual privacy, data protection and data integrity have been the primary focus at all stages of this concept selection study**

# The focus on data privacy has led to an exploration of both thick and thin client approaches



**A thin client** transfers all GNSS positions to a central data solution where map-matching is used with updated maps. This means that you can also price different road types differently within one area



**A thick client** means that all data on distance traveled and calculation of pricing takes place locally in a unit in the vehicle. It is challenging to keep up-to-date maps and price matrices in all units. Then it is easier to use geofencing.

# Kapsch has adopted the 'thin client' approach, using data from existing mobile devices to calculate distance, time and type

- **Joint project** with local partners, led by Kapsch & Aventi
- **Existing Android application** already in use for real-time, location-based safety notifications
- Automatic start/stop function and in-vehicle Bluetooth detection of the device
- c.30,000 real world and simulated vehicles
- **Variable road user charges** based on driven distance, vehicle type, time of day and road classification
- Location and vehicle data provided by approximately **15 different smartphone and tablet models**
- Matched >2 million kilometres
- **Real time rating of trips** derived from a complex pricing table and sent immediately to the driver

*Kapsch Norway RUC PoC Tariff Table*

		Urban			
		Non-Urban	Non-weekday	Weekday	
				Non-rush-hour	Rush-hour
Motorway	Zero-emission	0.33	0.79	1.25	3.57
	Plug-in hybrid	0.35	0.83	1.31	3.75
	Gasoline	0.36	0.86	1.35	3.85
	Diesel	0.40	0.95	1.49	4.27
Trunk	Zero-emission	0.33	0.79	1.25	3.57
	Plug-in hybrid	0.35	0.83	1.31	3.75
	Gasoline	0.36	0.86	1.35	3.85
	Diesel	0.40	0.95	1.49	4.27
Primary	Zero-emission	0.30	0.71	1.12	3.21
	Plug-in hybrid	0.32	0.75	1.18	3.37
	Gasoline	0.32	0.77	1.21	3.47
	Diesel	0.36	0.85	1.34	3.84
Secondary	Zero-emission	0.27	0.63	1.00	2.86
	Plug-in hybrid	0.28	0.67	1.05	3.00
	Gasoline	0.29	0.68	1.08	3.08
	Diesel	0.32	0.76	1.20	3.42
Tertiary and Unclassified	Zero-emission	0.20	0.48	0.75	2.14
	Plug-in hybrid	0.21	0.50	0.79	2.25
	Gasoline	0.22	0.51	0.81	2.31
	Diesel	0.24	0.57	0.90	2.56
Residential	Zero-emission	0.17	0.40	0.62	1.79
	Plug-in hybrid	0.18	0.42	0.66	1.87
	Gasoline	0.18	0.43	0.67	1.93
	Diesel	0.20	0.47	0.75	2.13
Track	Zero-emission	0.00	0.00	0.00	0.00
	Plug-in hybrid	0.00	0.00	0.00	0.00
	Gasoline	0.00	0.00	0.00	0.00
	Diesel	0.00	0.00	0.00	0.00

Prices in NOK per km

Click [here](#) for more  
information about Road User  
Charging



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