

Efficient improvement of air quality

vehicle emission knowledge to improve air quality

Polis Conference
November 29, 2012
Perugia

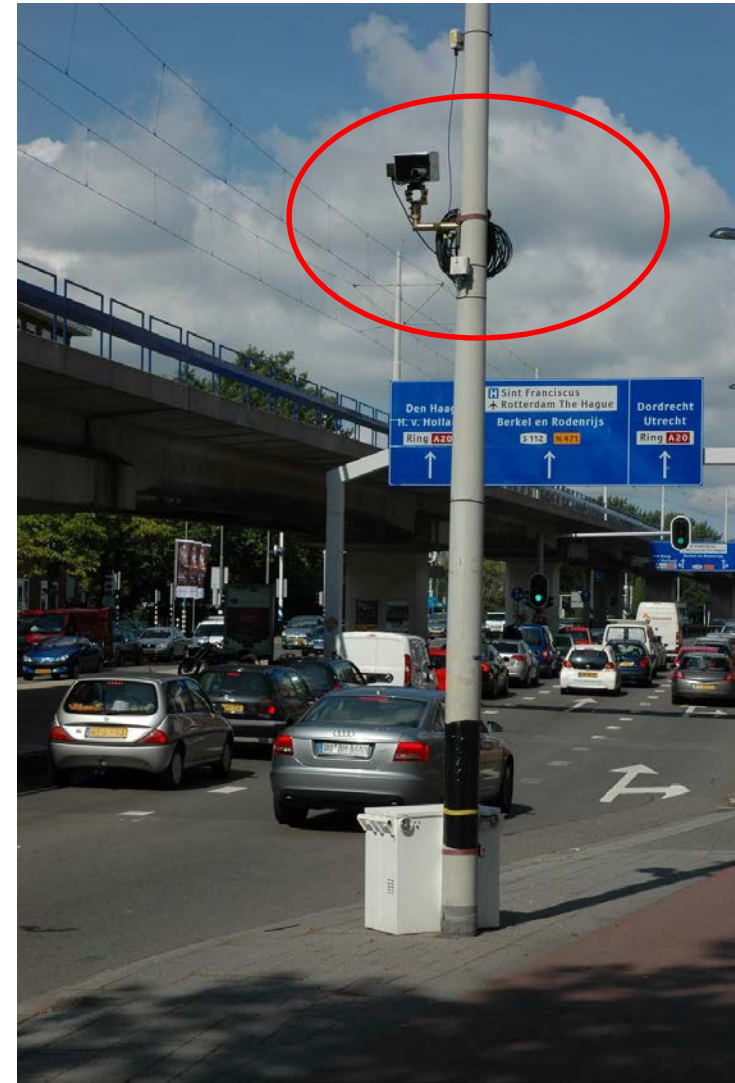
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TNO



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Improve air quality in urban environment

- › (Dutch) cities invest significantly to improve air quality
 - › To fulfil European air quality standards (NO₂ / PM₁₀)
 - › To make cities more attractive
 - › To reduce impact on public health
- › Traffic emissions contribute significantly to local air pollution
- › High pressure on available budgets of cities
- › Methodology to quantify the effects of air quality measures was developed to select the most efficient options

Methodology: step 1 vehicle park scan

- › Vehicle fleet composition is crucial:
 - › Needed to calculate total traffic emissions
 - › Need to understand the various sources / vehicle type
 - › Needed to calculate the effects of measures
 - › Composition varies per city (even within cities)

- › Vehicle fleet scan was developed and introduced

- › Detailed insight in vehicle fleet in a city is obtained
 - › Heavy trucks, buses, vans, passenger cars
 - › Emission relevant subclasses (Euro classes, fuel etc))

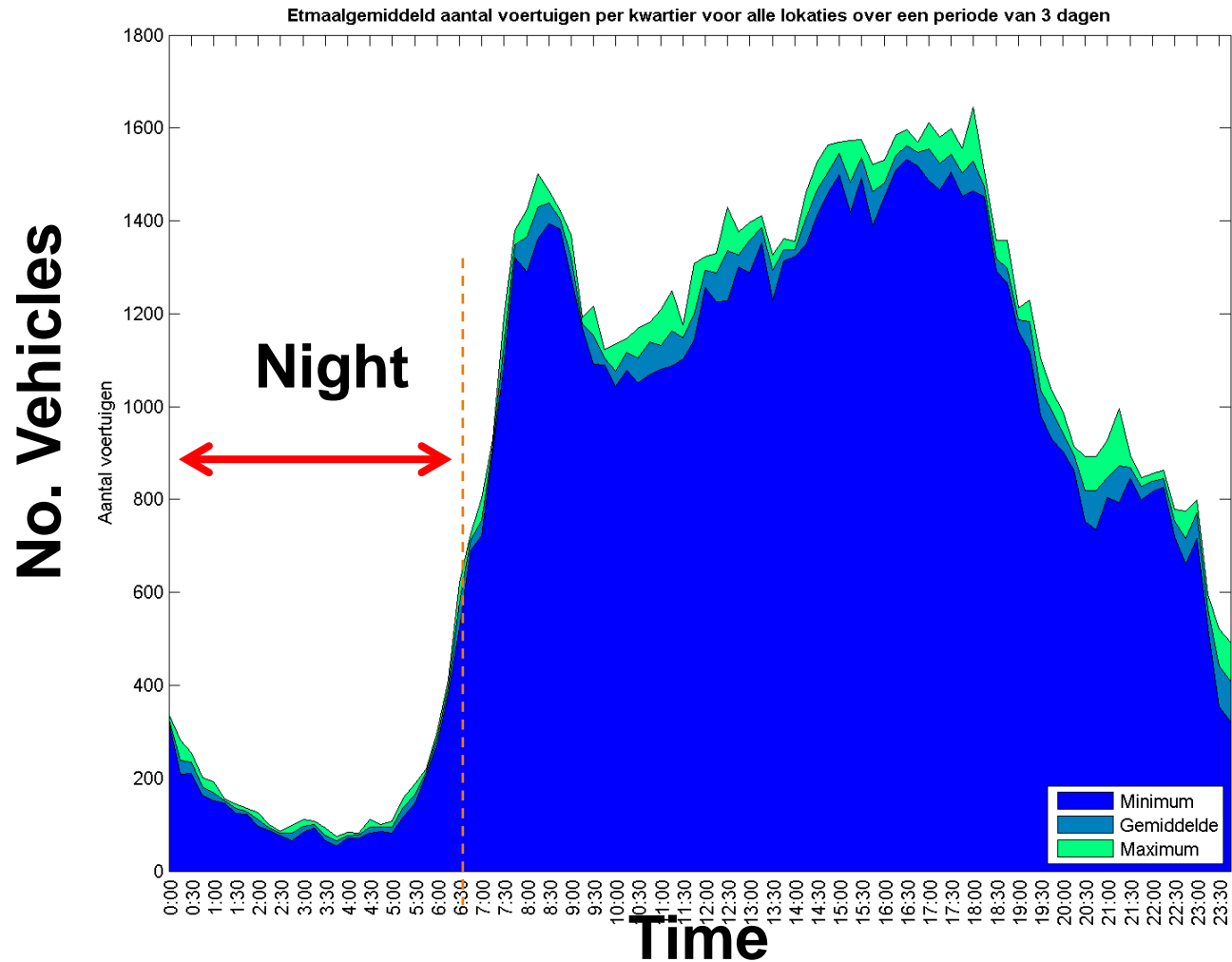
Methodology: step 1 vehicle park scan

- › License plate recognition camera's installed
- › license plates of all passing vehicles detected (7 days 24h)
- › License plates linked to technical vehicle info (road authority)
 - › Truck, Van, Passenger car, Bus
 - › Vehicle manufacturer, vehicle type, weight ...
 - › Fuel, engine type
 - › Year of first registration ... etc...
- › Vehicles divides into subclasses (emission classes)
- › TNO Emissions model Versit+ used to calculate emissions per vehicle class

Vehicle intensity over 24 hours

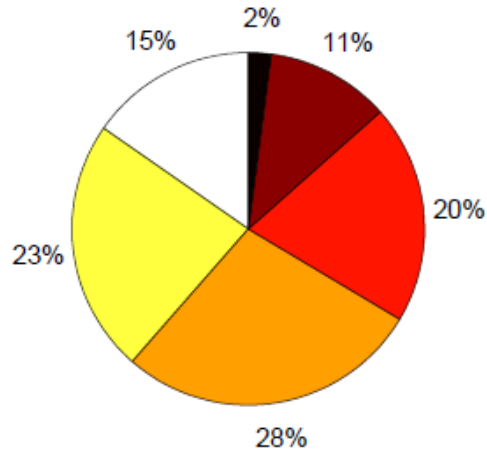
TNO, 21-Feb-2012

TNO innovation
for life

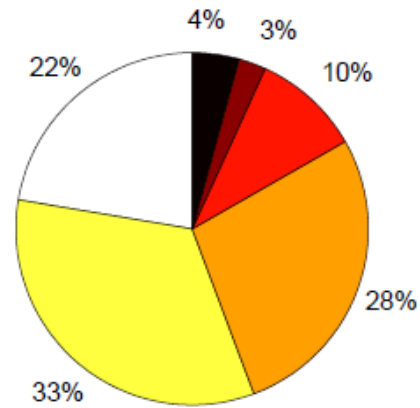


Vehicle fleet composition

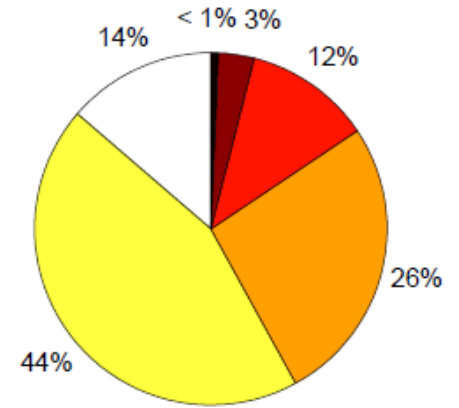
Petrol Cars



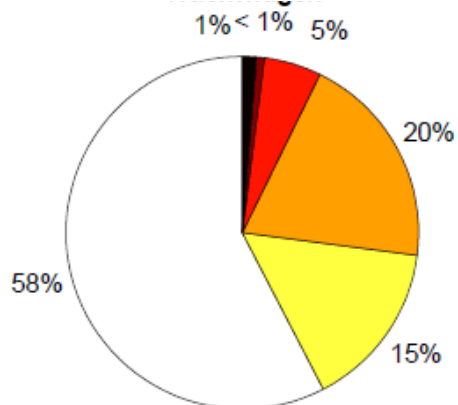
Diesel Cars



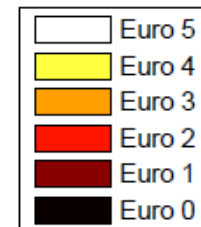
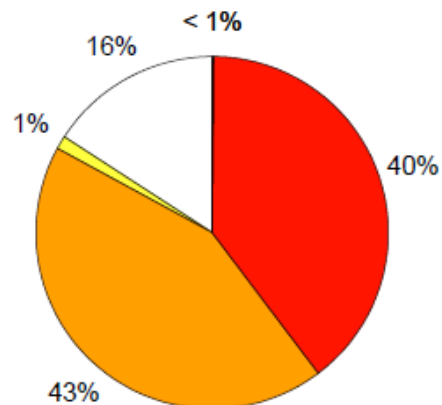
Vans



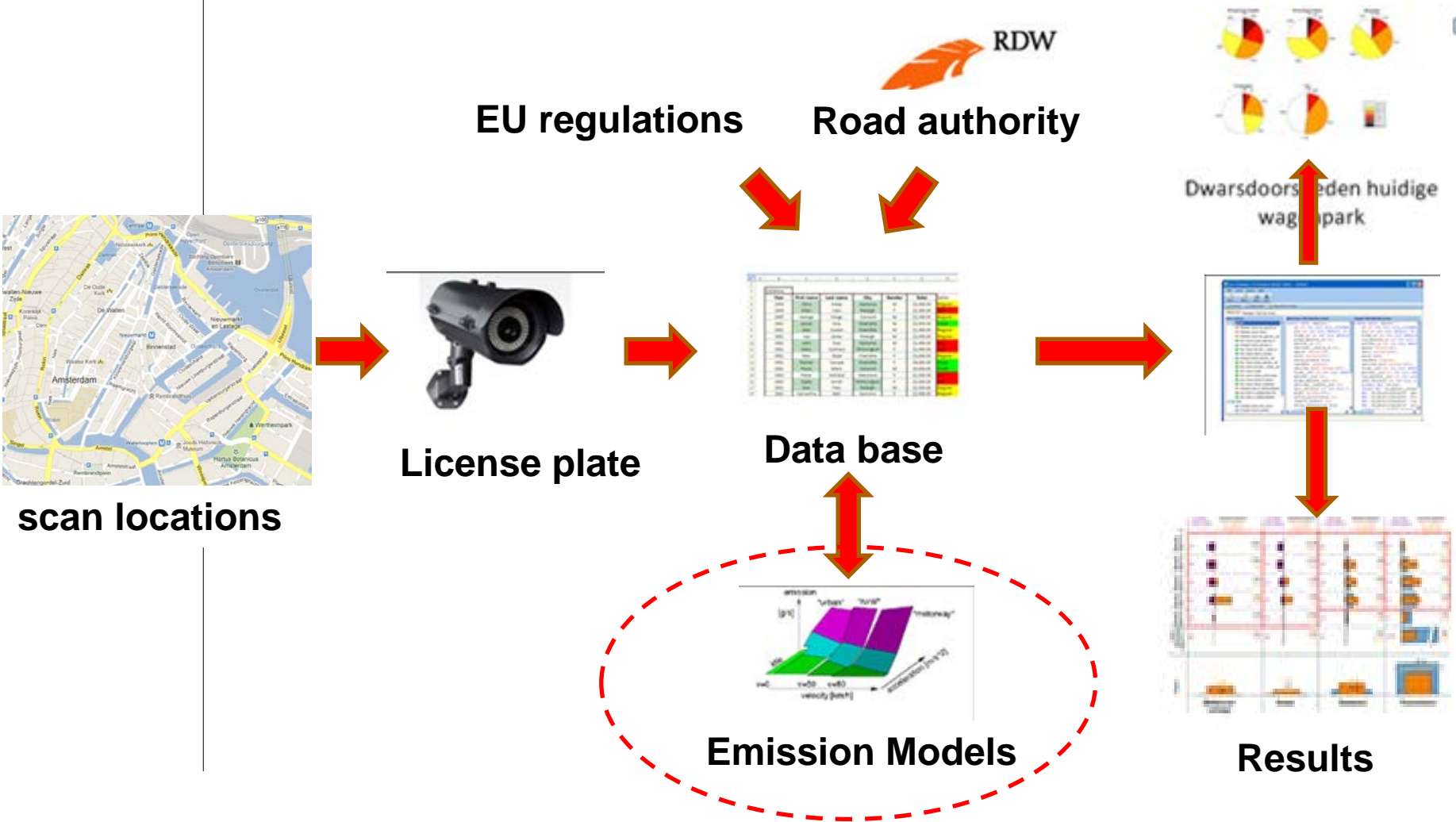
Trucks



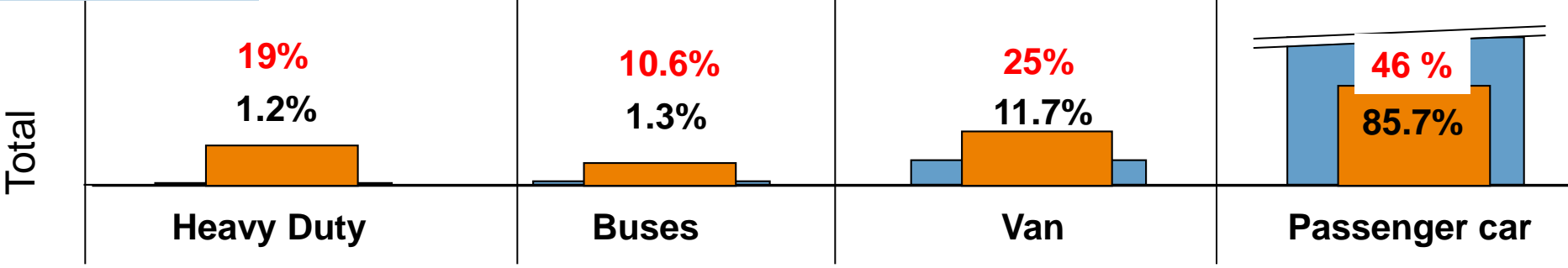
Buses



Step 2: Adding vehicle emission info

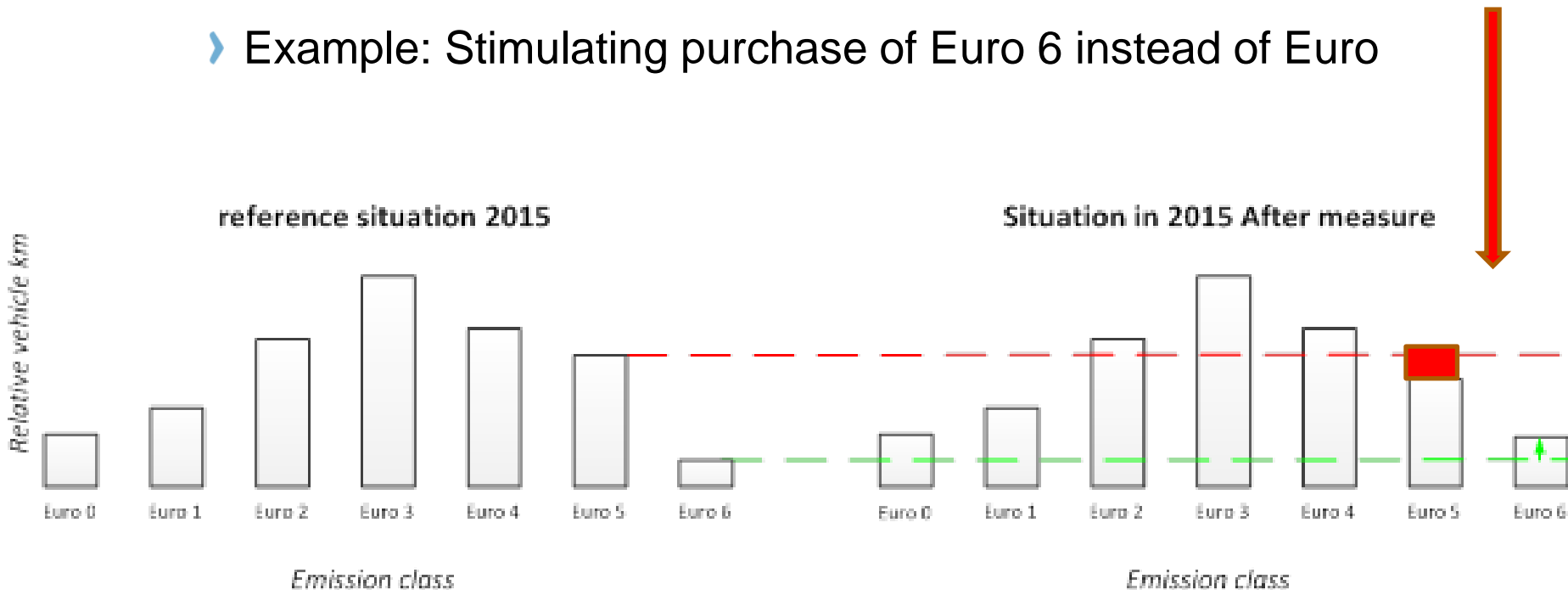


Relative share in distance / emissions

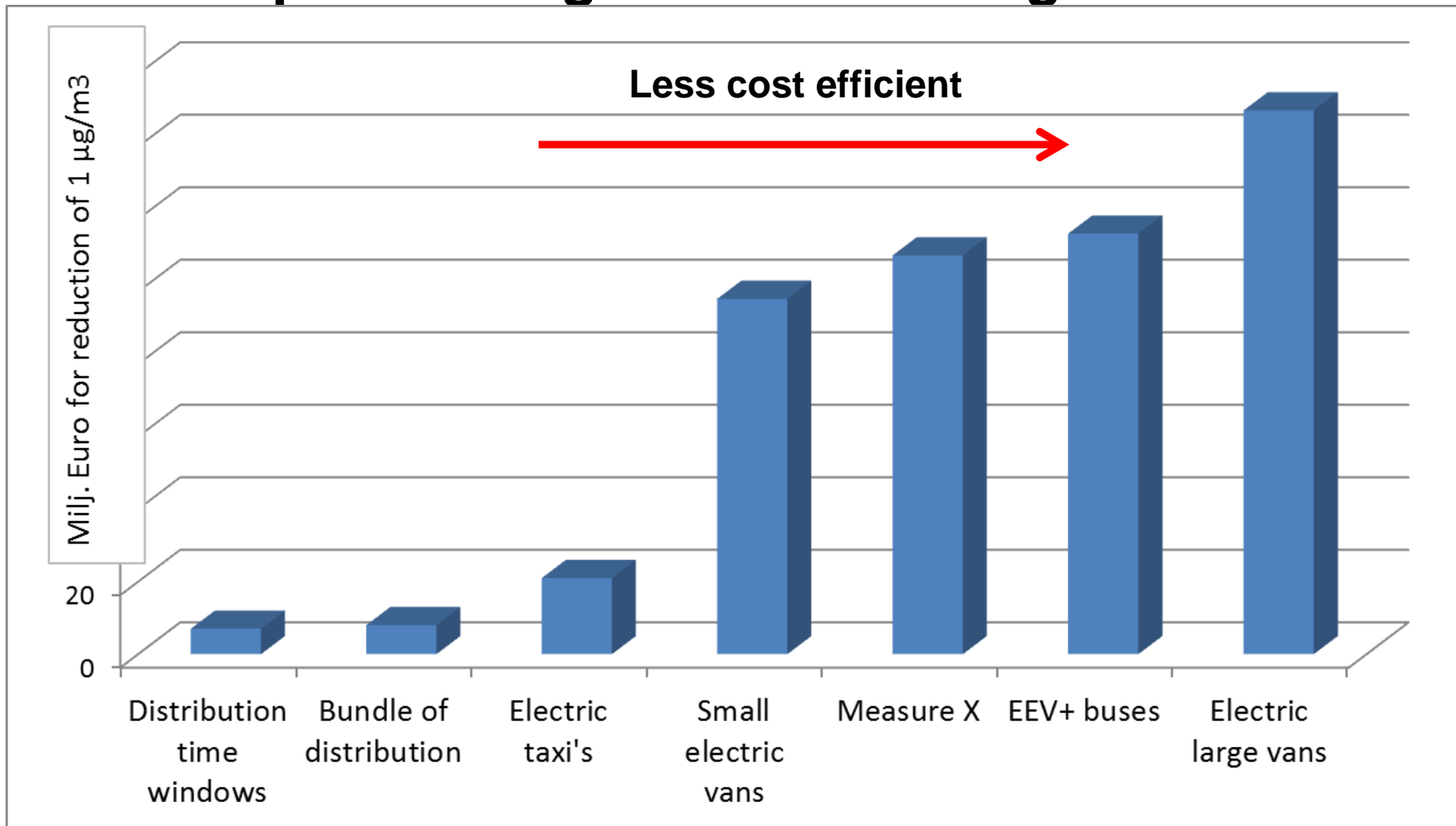


Step 3: Calculating effects on emissions

- › Simplified example of calculation of effects
- › Example: Stimulating purchase of Euro 6 instead of Euro 5



Step 4: Adding costs & ranking measures



Conclusions

- › Calculating cost effectiveness (milj. Euro / ug/m³) is very powerful to define a cost effective air quality program
- › Comprehensive knowledge of REAL WORLD vehicle emissions, vehicle fleet composition and air quality is required
- › The approach has been developed by TNO in cooperation with the city of Amsterdam, and ...
- › As a results, the effectiveness of the air quality program in Adam was increased by 60% and the cost lowered by 30%
- › Methodology can be applied in all cities...