



VRU-Proxi-06-06

# VRU-proxi IWG

## Accidentology analysis summary

AstaZero, Sandhult (Sweden), 19-21 june 2018



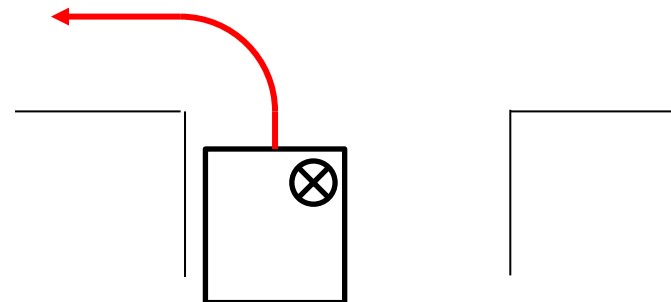
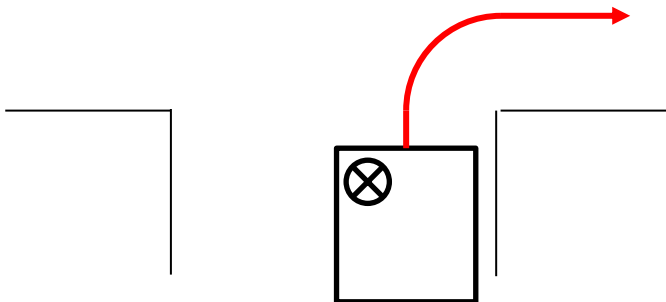
# Introduction

## ➤ Additional results:

- Injury criteria added and considered
- Distribution of vehicle categories according to accident scenarii and injury severity
  
- Updated data: Canadian data
  - Completed with Peter BURNS's presentation
- Additional data: GB data



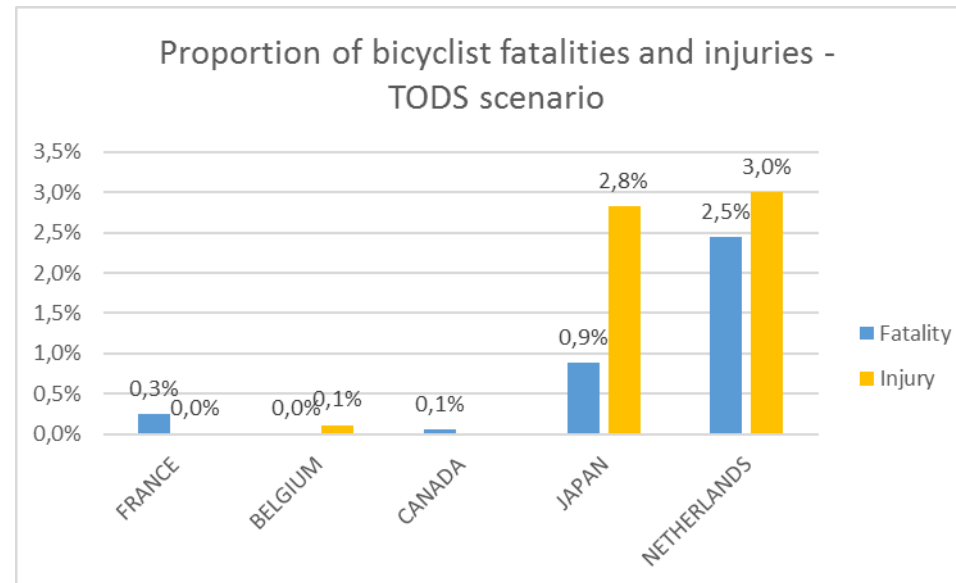
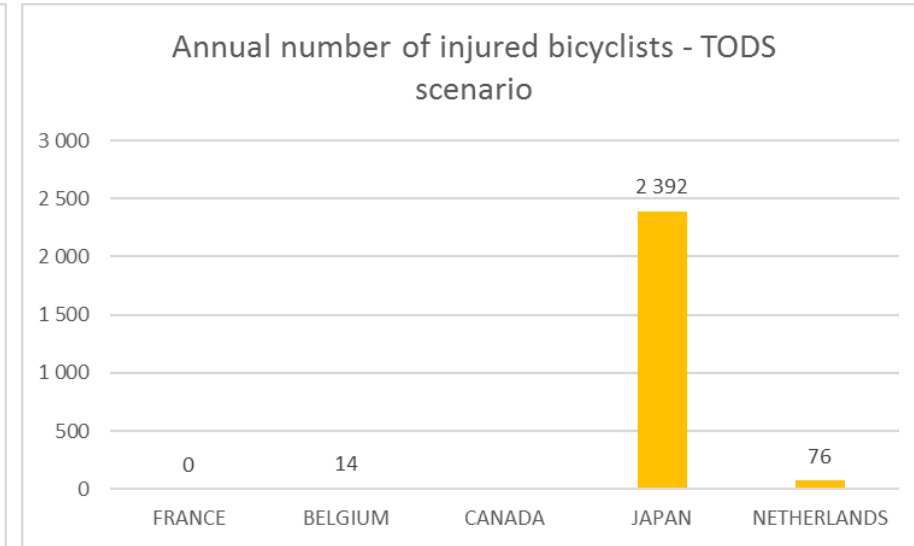
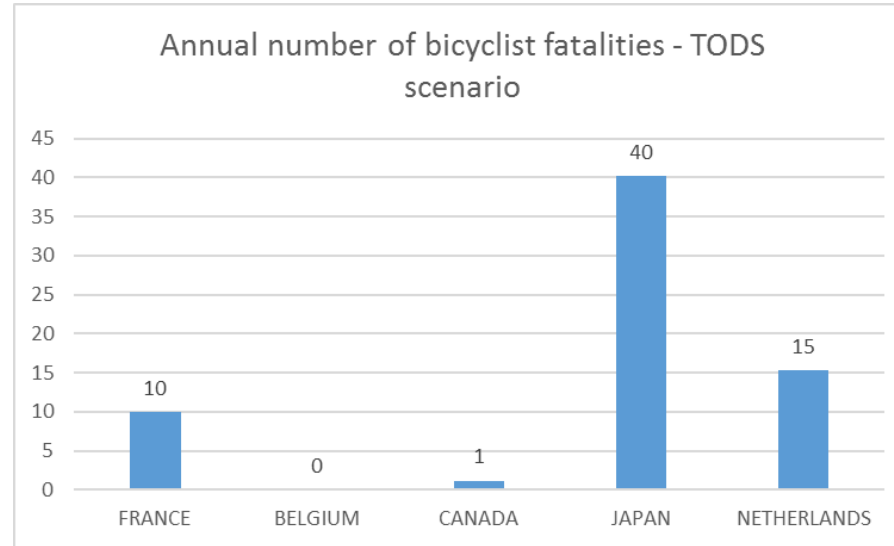
# Turn Opposite to Driver Side (TODS) scenario VRU: bicyclist



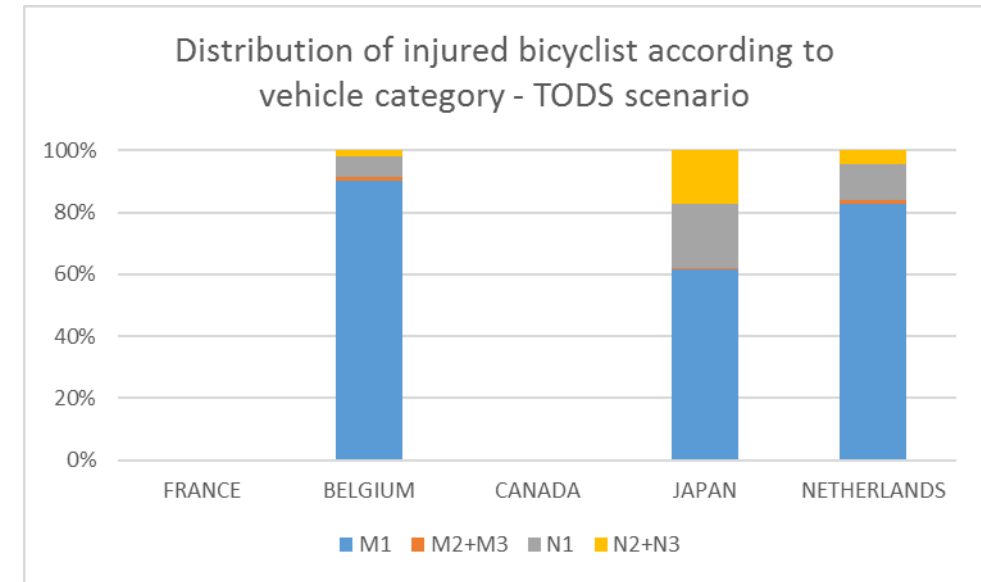
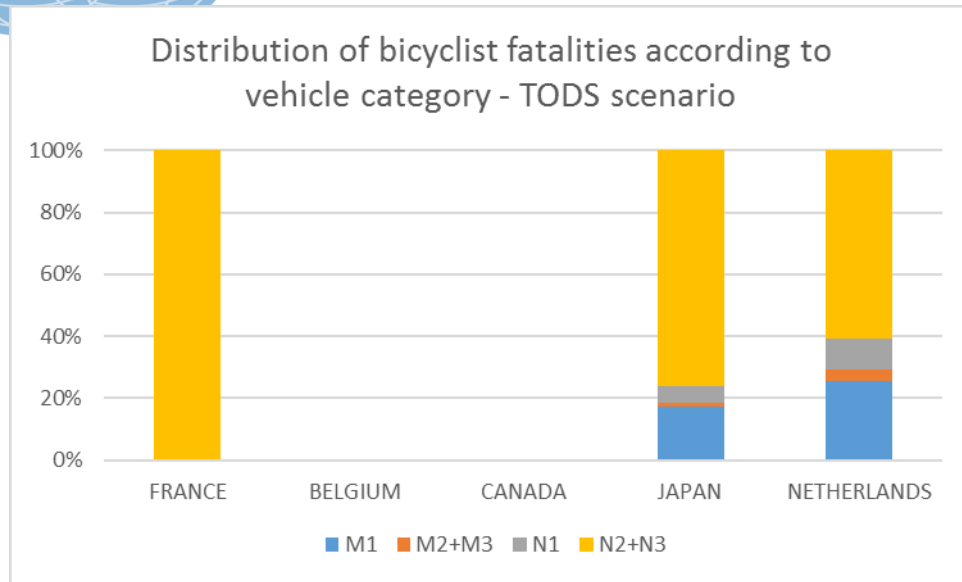


# Turn Opposite to Driver Side (TODS)

- *Driving speed*
  - *NL: ≤ 51 kph*
  - *CA: ≤ 40 kph*
  - *FR, BE: ≤ 30 kph*
  - *JA: ≤ 20 kph: JA*
  
- *Canada: Peter Burns will present more results regarding injured bicyclists*



# Turn Opposite to Driver Side (TODS)



- Common vehicle categories available for each country
- Mainly N2 +N3 vehicles for bicyclist fatalities
  - In Japan, mainly N2 > 7,5t and N3
  - In The Netherlands, mainly N3



# Turn Opposite to Driver Side (TODS)

- UK: Pedal cyclist casualties in 2-vehicle accidents (with an HGV) where the speed limit is 30mph or less, GB:2011-2016
  - 69 bicyclist fatalities (~ 4 fatalities per year)
  - 1394 injured bicyclists (~232 injured bicyclists per year)
  - HGV driver turning left
    - 31 fatalities and 303 injuries
      - HGV over 8t: 26 fatalities and 163 injuries
      - HGV under 8t: 1 fatalities and 72 injuries
      - HGV gross weight unknown: 4 fatalities and 68 injuries



# Turn Opposite to Driver Side (TODS) - Conclusions

- TODS does not consider the bicyclist manoeuvre
  
- Some figures may be overestimated because in some answers the vehicle speed (30 to 50 kph) was exceeding the “low speed” scope (20 kph).
  
- The highest % of bicyclist injuries and fatalities are in Japan and The Netherlands where:
  - Fatalities are the consequences of a collision with a N2 > 7.5 t or a N3



# Turn Opposite to Driver Side (TODS) - Conclusions

## ➤ SAFETYCUBE Decision Support System

- Funded within the Horizons 2020 Programme of the EC
- Aims to support evidence-based policy making
- Systematic literature review approach
  
- BSIS: One study found dealing with BSIS efficiency
- SAFETYCUBE conclusions:



*The safety potential of a 'turning assistant system' and an intelligent rear view camera accounts for 6% of prevented accidents in relation to all truck accidents.*

*In the study generic systems are used and the estimates are probably higher than the real benefits from the systems, because real systems are subject to constraints, which can't be included in these estimates.*

*Kuehn, M. et al. "Advanced Driver Assistance Systems for **Trucks** – Benefit Estimation from Real-Life Accidents". 22nd Enhanced Safety of Vehicles Conference in Washington, D.C., June 2011. Paper Number 11-0153*

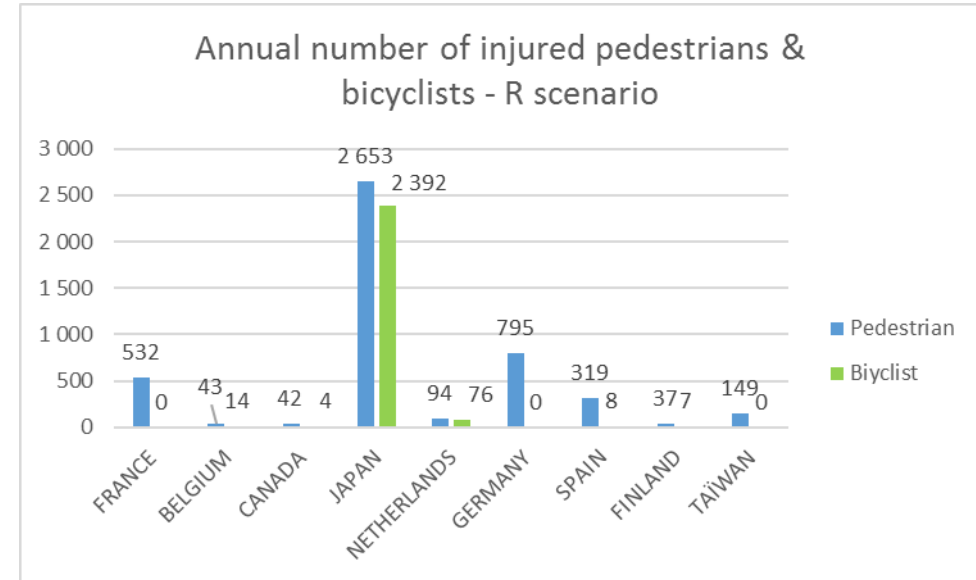
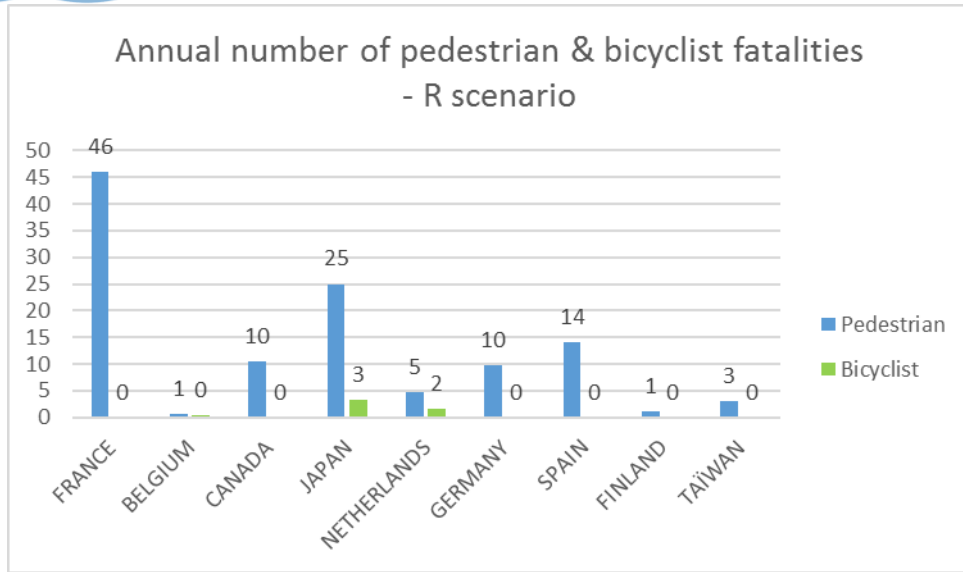
*<https://www.roadsafety-dss.eu/#/reference/345>*





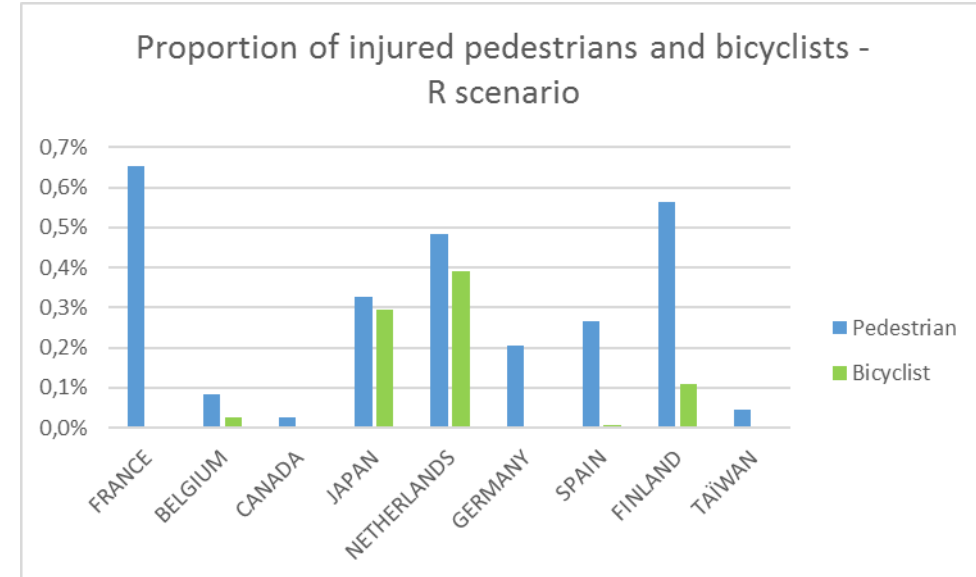
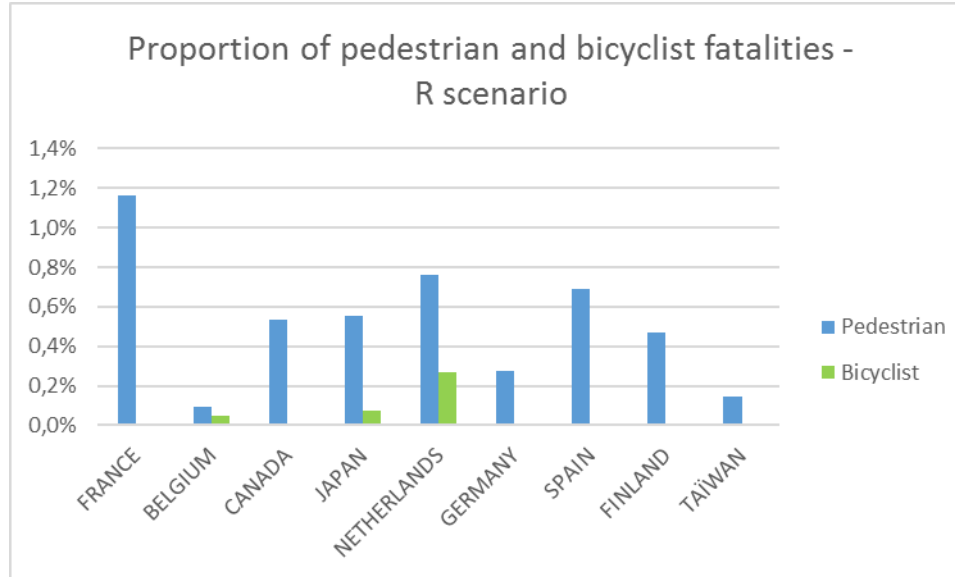
# Reversing manoeuvre (R)

# Reversing manoeuvre - R



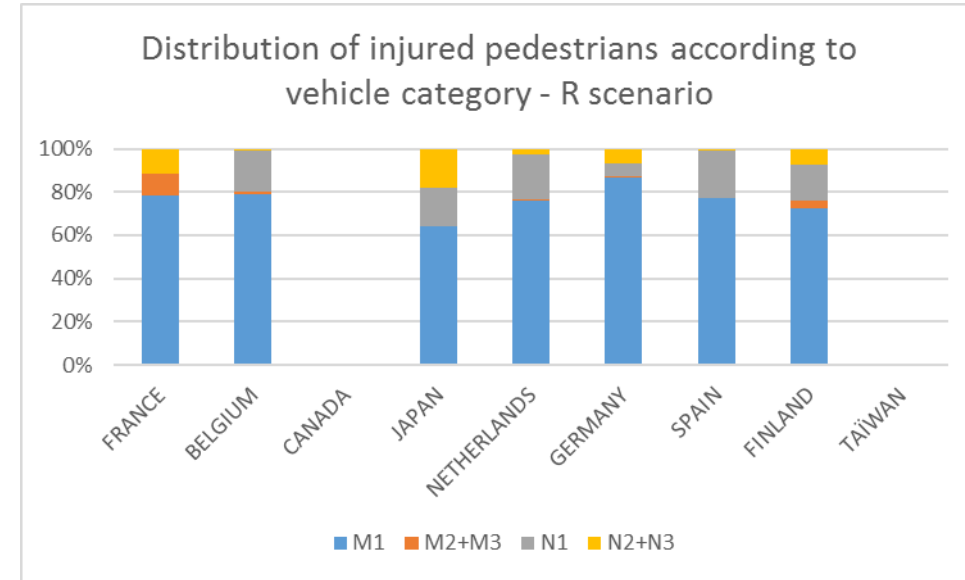
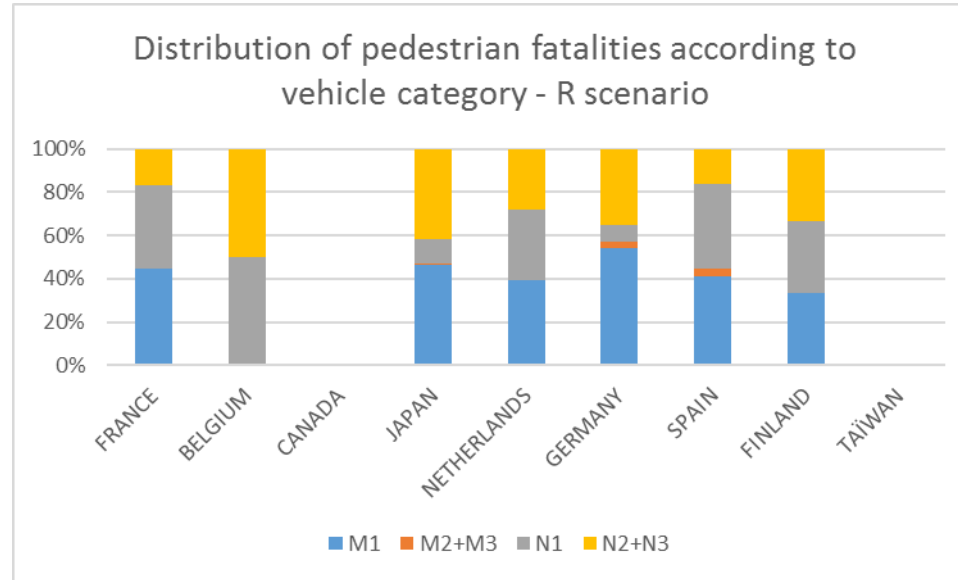
- All driving speeds are considered
- Pedestrians are more involved in this accident configuration than bicyclists

# Reversing manoeuvre - R



- It is not more than 1.2 % of national road fatalities and 0.7% of national road injured road users

# Reversing manoeuvre - R



- More than 50% of pedestrian fatalities involved in R scenario are impacted by N1, N2 and N3

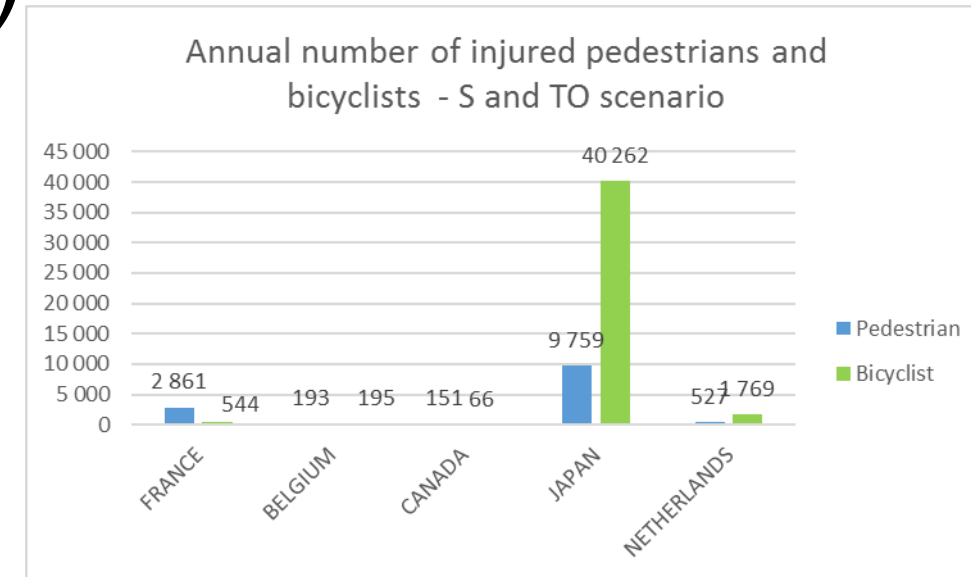
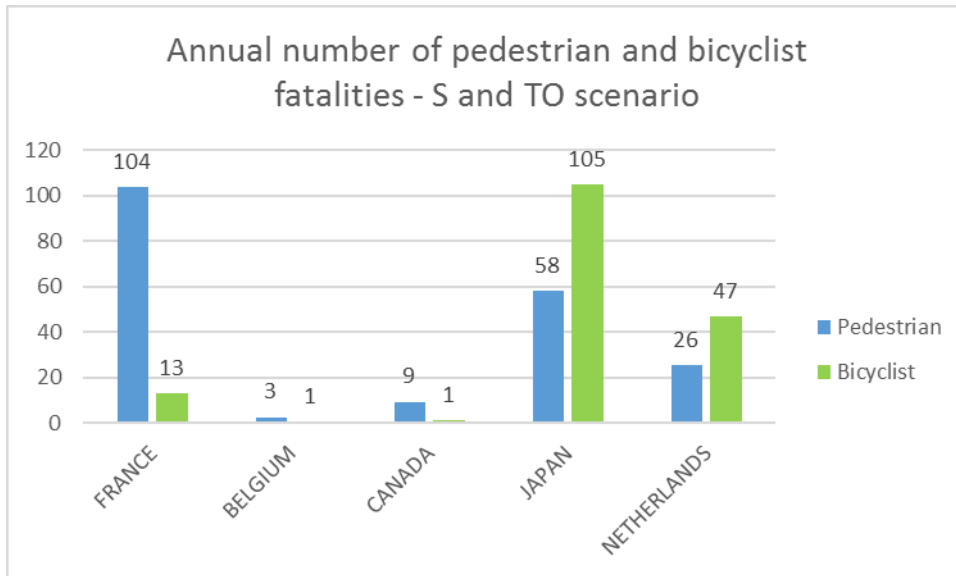
# Reversing manoeuvre - R

- Pedal cyclist casualties in 2-vehicle accidents (with an HGV) where the speed limit is 30mph or less, GB:2011-2016
  - 69 bicyclist fatalities (~ 4 fatalities per year)
  - 1394 injured bicyclists (~232 injured bicyclists per year)
  - HGV reversing
    - 0 fatality and 18 injuries
      - HGV over 8t: 0 fatality and 3 injuries
      - HGV under 8t: 0 fatality and 11 injuries
      - HGV gross weight unknown: 0 fatality and 4 injuries



# Straight and taking-off manoeuvres (STO)

# Straight and taking-off manoeuvres (STO)

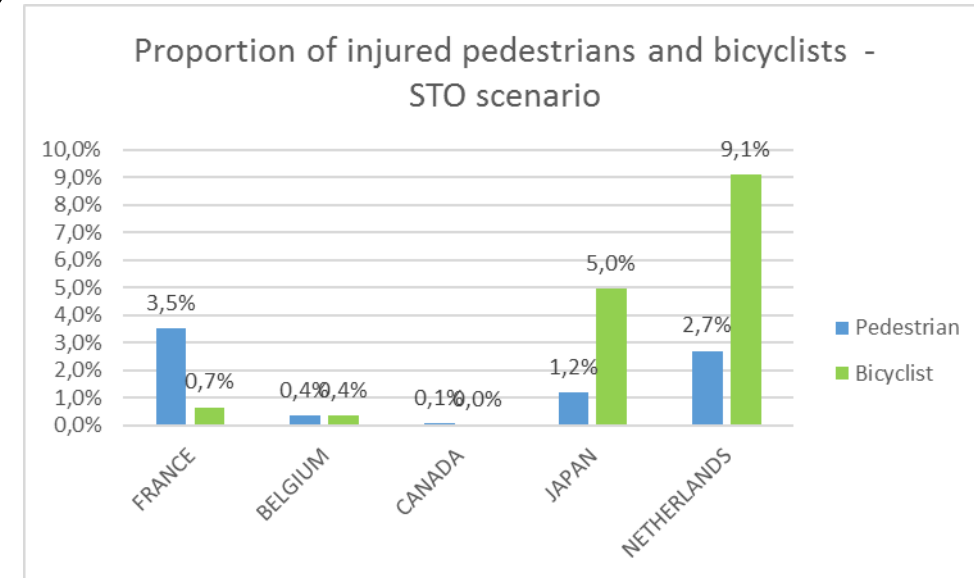
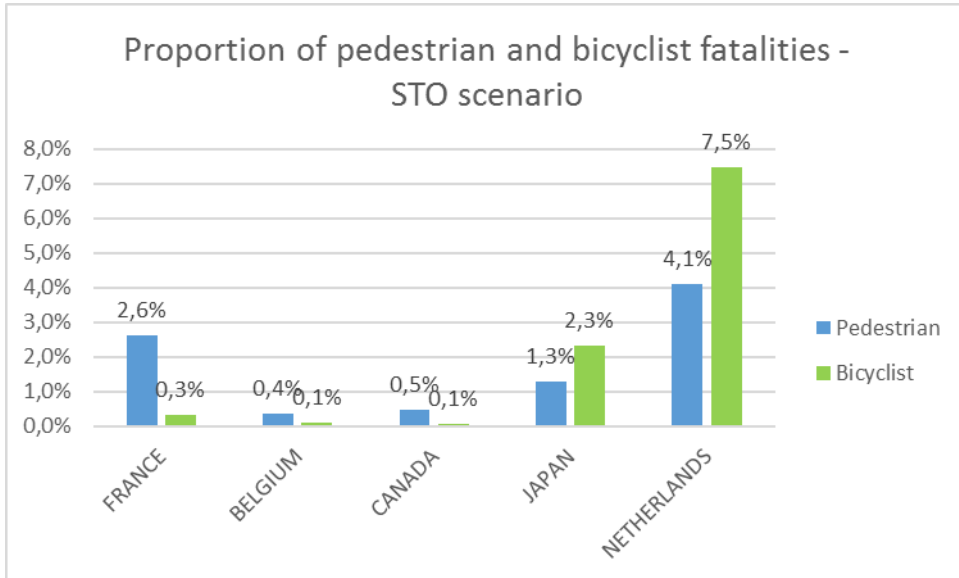


## ➤ *Driving speed*

- *NL: ≤ 51 kph*
- *CA: ≤ 40 kph*
- *FR, BE: ≤ 30 kph*
- *JA: ≤ 20 kph: JA*

## ➤ *A high number of injured bicyclists in this accident configuration in Japan*

# Straight and taking-off manoeuvres (STO)

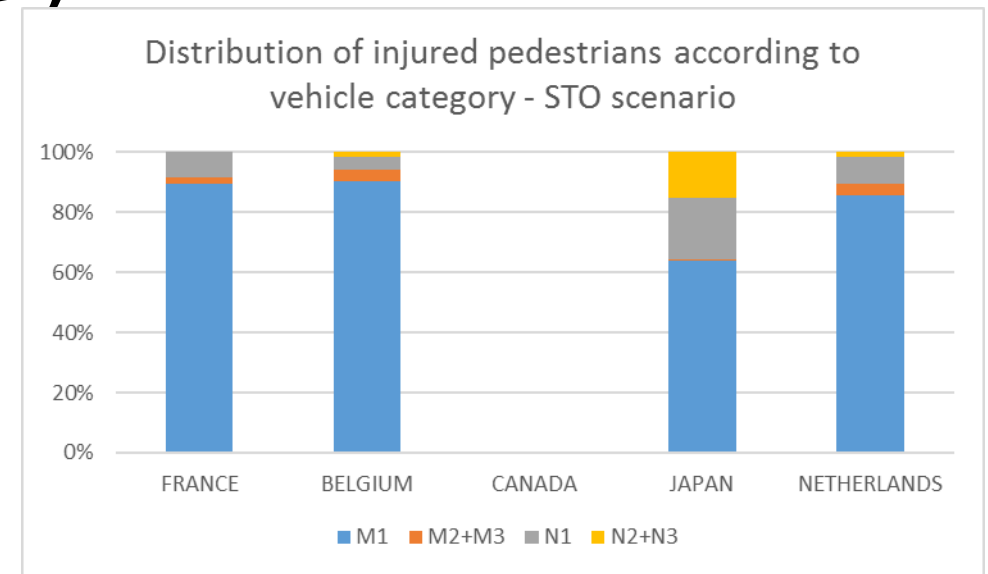
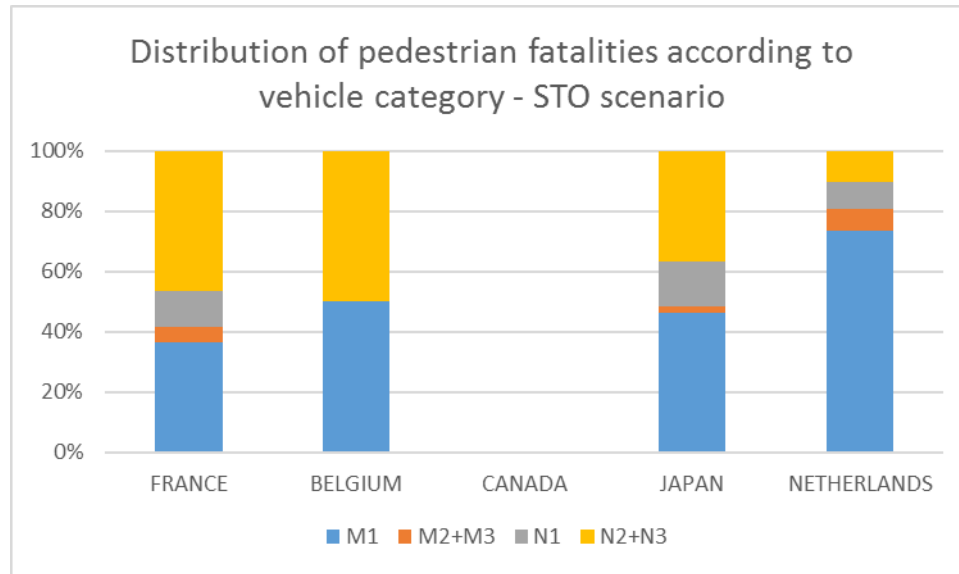


## ➤ Highest percentages for The Netherlands

- Could be an issue for NL comparing to other countries (but driving speed criteria is  $\leq 51$  kph)

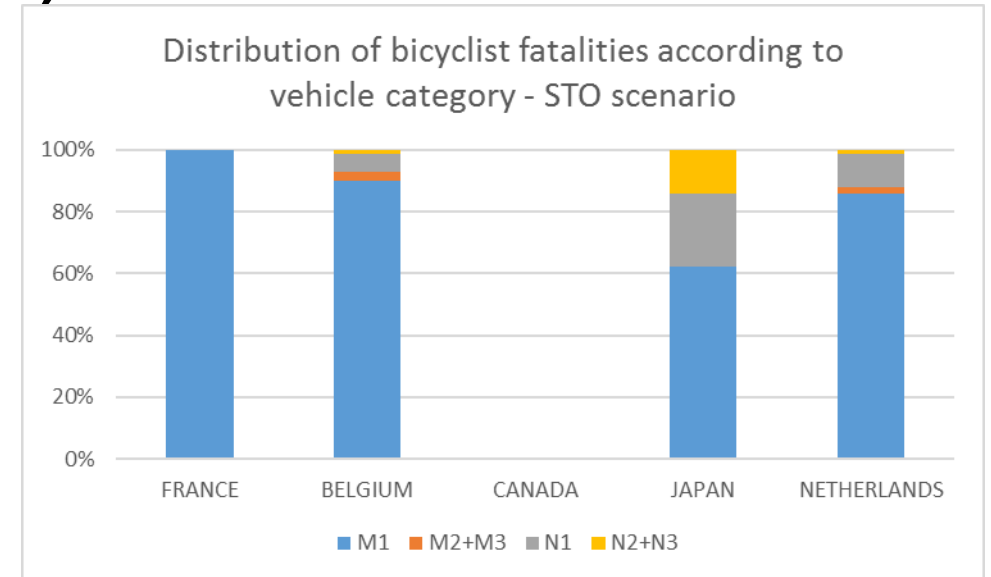
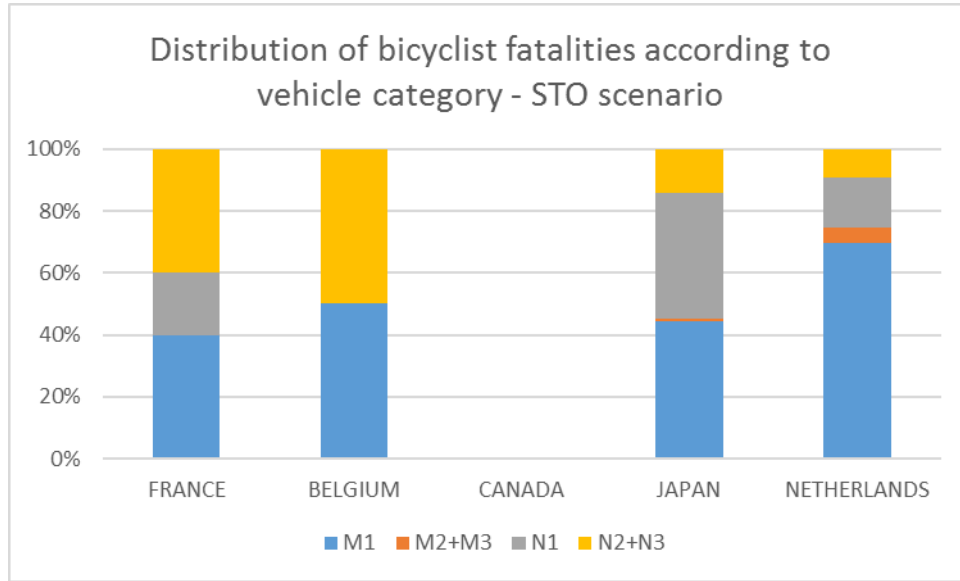


# Straight and taking-off manoeuvres (STO)



- Probably taking-off scenario and driving straight scenario have not the same causations; and not the same counter-measure
- In such accident configuration, collision partner:
  - for pedestrian fatalities: N2, N3 vehicles
  - For injured pedestrians: M1 vehicles
- Similar results with Canadian data

# Straight and taking-off manoeuvres (STO)



- Same conclusions as for pedestrian involved in STO scenario
- Probably not the same accident configuration
- Similar results with Canadian data



# Straight and taking-off manoeuvres (STO)

- Pedal cyclist casualties in 2-vehicle accidents (with an HGV) where the speed limit is 30mph or less, GB:2011-2016
  - 69 bicyclist fatalities (~ 4 fatalities per year)
  - 1394 injured bicyclists (~232 injured bicyclists per year)
  - HGV going straight or taking off
    - 27 fatalities and 468 injuries
      - HGV over 8t: 19 fatalities and 193 injuries
      - HGV under 8t: 5 fatalities and 124 injuries
      - HGV gross weight unknown: 3 fatalities and 151 injuries

# Conclusions

- Turn Opposite to Driver Side (TODS)
  - VRU: Bicycle
  - Overestimation of accident issues as bicyclist manoeuvre is not considered
  - N2 > 7.5t and N3 are the main opposite vehicles for bicyclist fatalities
  - Effectiveness of BSIS not studied
  
- Reversing (R)
  - VRU: Pedestrian
  - N1, N2 and N3 are the main opposite vehicles for pedestrian fatalities
  
- Straight and taking-off manoeuvres (STO)
  - Further analysis (data available) to distinguish taking-off and driving straight manoeuvres



THANK YOU