

## **A2 *New technologies for safe transport systems***

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### **Abstract**

In the transportation domain, innovations are manifold and vary to a large extent. Each innovation will have its consequences for safety. In case of transportation accidents, the emergency service have the task to fight the accident consequences.

Hence, one would expect that emergency services have full insights in innovations and trends in the transportation domain. In this presentation, we will present the results of a questionnaire that aimed to make clear what innovations in the transportation domain appear and in what timeframe, what the expected safety consequences might be, and the way one is prepared to deal with these safety consequences.

### **References**

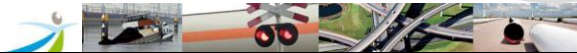
Rosmuller, 2013,  
Veiligheidsconsequenties van innovaties in de transport sector (in Dutch).



# Safety consequences of Innovations in the transportation domain

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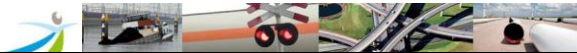
Verkenning van de veiligheidsconsequenties van innovaties in de transportsector





## Why?

- › In the transportation domain, innovations are manifold and vary to a large extent
- › Innovations, per definition, influence safety:
  - › Scenario's
  - › Probabilities
  - › Effects



## What?

- › An overview of the innovations and it's safety consequences:
- › Type of innovations like:
  - › IT, new haz.mats, vehicle, infrastructure, incident management
- › Time horizon:
  - › <1 yr, 1-3 yr's, 3-5yr's, 5-10yr's, >10yr's
- › Safety implications:
  - › Scenario's, probabilities, consequences
- › Preparation
- › Safety measures and the level of preparation





## How?

- › Questionnaire to make an inventory of the innovations and the accompanying safety consequences:
  - › Internet, 3 weeks in 2013
  - › Members of the platform Transportation safety
- › Respondents specify:
  - › innovations and
  - › per innovation fill's out the fields: transportation mode, time horizon, Safety implications, Preparation, safety measures

Sector	Aantal
Bedrijfsleven	155
Brandweer	23
Politie	7
Gezondheid	4
Veiligheidsregio	37
Gemeente	17
Overheid	22
Provincie	10
Rijk	13
Kennis	14
Geen categorie	3
<b>Totaal</b>	<b>305</b>



## Results

- › Response: n= 108

1. In welke sector bent u werkzaam?		
	Percentage reacties	Aantal reacties
Beleidsregelgeving	10,2%	11
Verlader gevaarlijke stoffen	0,9%	1
Vervoerder gevaarlijke stoffen	6,6%	7
Chaufeur	0,9%	1
Ontvanger gevaarlijke stoffen	0,0%	0
Hulpdienst	27,8%	30
Infrabeheer	7,4%	8
Kennisinstituut	22,2%	24
Consultancy	12,0%	13
Anders, namelijk	12,0%	13
beantwoorde vraag		108





## Results

cluster	Number of innovations
Information technology	6
New haz.mats	7
Vehicle	6
Infrastructure	3
Transportation flows	3
Incident management	7
various	2



## Results

cluster	road	rail	water	sea	pipeline	air
Information technology	12	15	9	15	4	6
New haz. Mat.'s	20	9	15	11	2	2
Vehicle	10	3	4	1	0	0
Infrastructure	3	1	1	0	1	1
Transportation flows	3	4	3	0	0	0
Incident management	4	3	2	2	0	0
various	1	1	1	1	1	1



### Results: haz.mat.'s

	#	road	rail	Water	sea	pipeline	air
LNG	10	9	4	8	5	0	0
Hydrogen	3	3	2	3	3	1	1
CNG	3	1	0	1	0	0	0
Alt. Fuels	4	4	1	2	2	0	0
New haz.mat.'s	1	1	0	0	0	0	0
Nano materials	1	1	1	0	0	0	0
Bio-fuels	1	1	1	1	1	1	1
<b>total</b>	<b>23</b>	<b>20</b>	<b>9</b>	<b>15</b>	<b>11</b>	<b>2</b>	<b>2</b>



### Results: haz.mat.'s

› **Time horizon**

- › <3yr

› **Safety implications:**

- › Increased accident probabilities
- › Increased accident consequences

› **Preparation**

- › insufficient prepared: lack of knowledge of the hazrads and the acc. scenarios





## Conclusions

- › **In particular haz.mat.'s are concerning:**
- › Increased accident Probability
- › Increase accident consequences
- › Already apparent
- › Lack of knowledge concerning the hazards and it's scenario's
- › Insufficient preparation



## Conclusions

- › **In particular 'new' haz.mat.'s are concerning and there is an urgent need for a comprehensive risk assessment regarding:**
- Assessing accident Probability
- Modelling the accident consequences
- Emergency response strategies and tools

