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Federal Department of Home Affairs FDHA  
Federal Statistical Office FSO

# Statistics on the costs and funding of transport

## The Swiss approach to measuring compliance with the polluter pays principle

Christian Gigon, Swiss Federal Statistical Office  
ITF statistical meeting, 17 March 2016, Paris



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# 1. Historical review

## 1968 – 2006: Earlier monetary transport statistics

not comparable

### Since 1968 'Swiss Road Account'

- Expenditure and costs of road infrastructure
- State revenue related to motorised road traffic
- Coverage of expenditure respectively costs

### Since 1976 'Swiss Railway Account'

- Expenses of railway enterprises
- Income of railway enterprises (incl. subsidies)
- Economical costs of the railway system
- Coverage of costs (micro- and macro-economically)

### Since 2006 'Transport Account' (motorised road and rail)

- Social cost of transport
- Degree of cost coverage (comparable for road and rail)



# 1. Historical review

2009: Project start '*Costs and Funding of Transport (CST)*'

## Principle objectives

- Measuring the social costs of transport
- Measuring compliance with the polluter pays principle

## Demands concerning the methodology

- Coherent methodology for all modes of transport
- State of the science

## New modes of transport

(besides motorised road and rail transport)

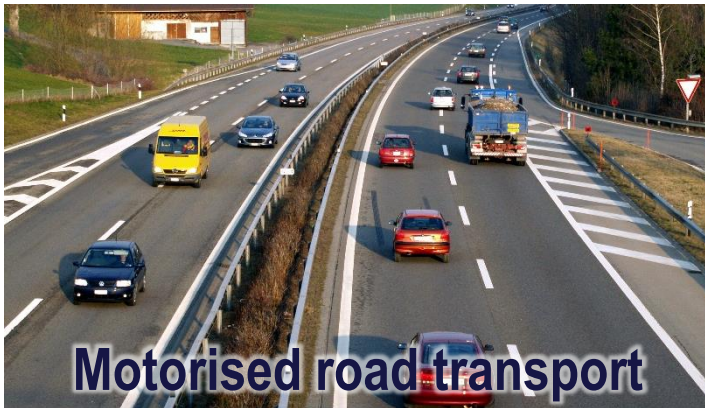
- Human-powered mobility (walking & cycling)
- Civil aviation
- Transport on inland waterways



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## 2. Methodological framework

### Modes of transport covered by CST









## 2. Methodological framework

### Some principles

#### Territoriality principle

- Costs caused by transport on Swiss territory (even though the costs arise outside Switzerland, e.g. climate change)
- Exception: 'halfway principle' used for aviation; half of the costs allocated to land of departure respectively destination

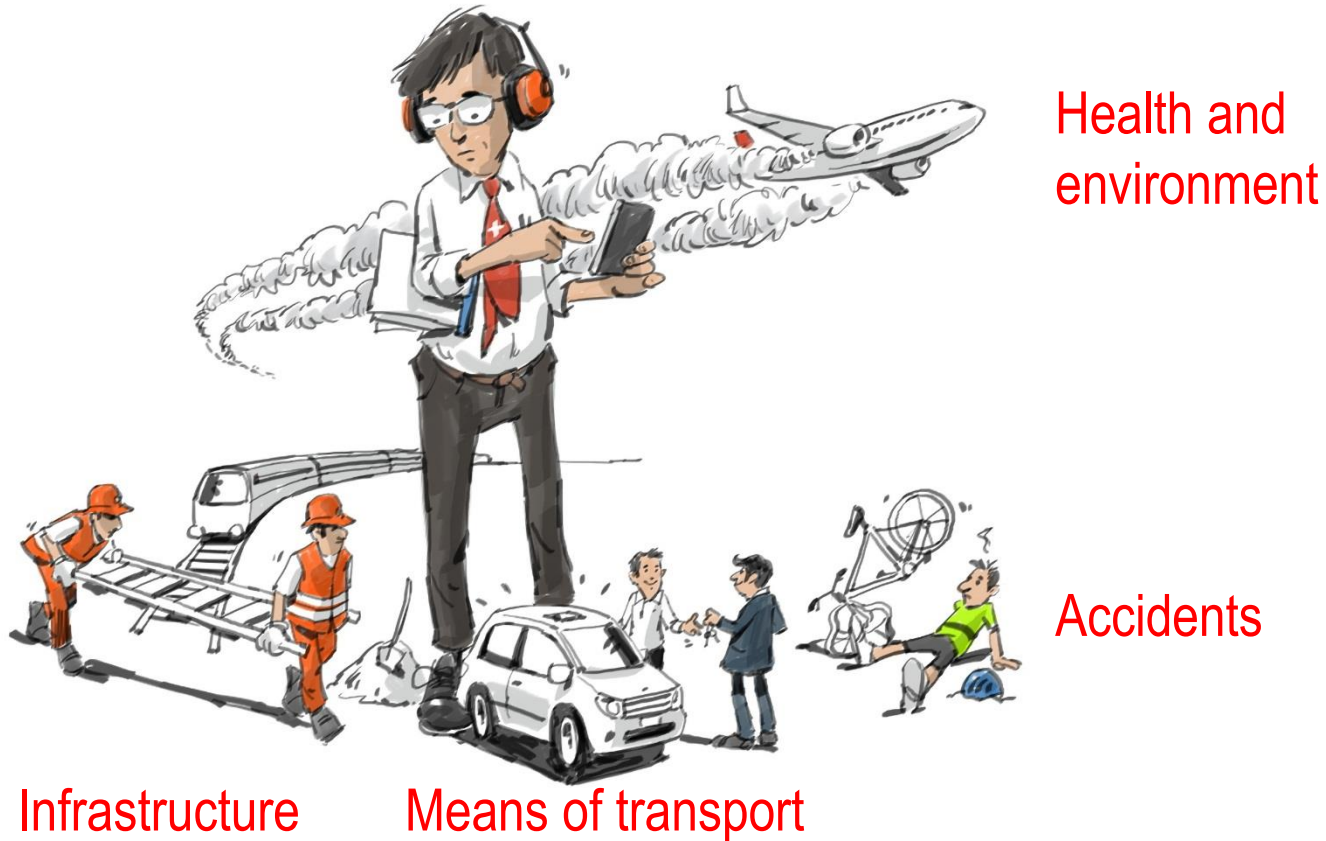
#### Social costs

- Social costs = private costs ('self-borne costs') + external costs
- Including non-monetary costs (such as suffering/harm due to accidents)



## 2. Methodological framework

### Types of costs considered







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## 2. Methodological framework

### Data sources and used methods

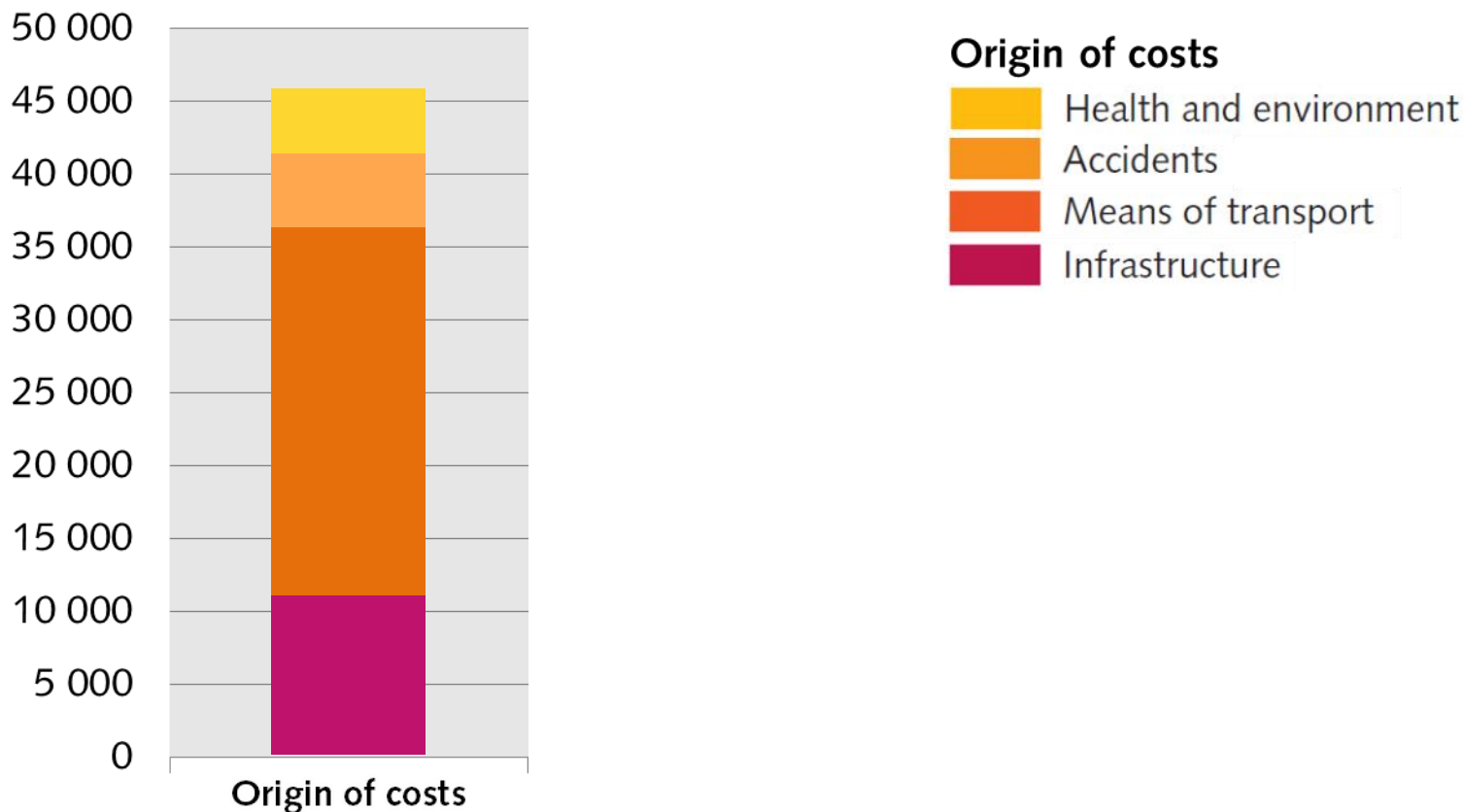
	Road transport			Rail transport	Air transport
	Private motorised transport	Public road transport	Human-powered mobility		
Infrastructure costs	Exhaustive survey of infrastructure costs of the public sector; allocation between vehicle types based on empirical studies of infrastructure projects			Exhaustive survey of expenses and income of railway enterprises	Partial survey of expenses and income of airlines, airports and air traffic control services
Costs for means of transport	Extrapolation based on kilometre rates of model cars, lorries, vans etc.	Exhaustive survey of expenses and income of transport enterprises	Extrapolation based on expenditures per household		
Accident costs	The model calculations of external costs required the calculation of social costs first. The social costs for accident, health and environment are taken over from the external cost calculations executed by the Swiss Federal Office for Spatial Development.				
Costs for health and environment					



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### 3. Three-step model

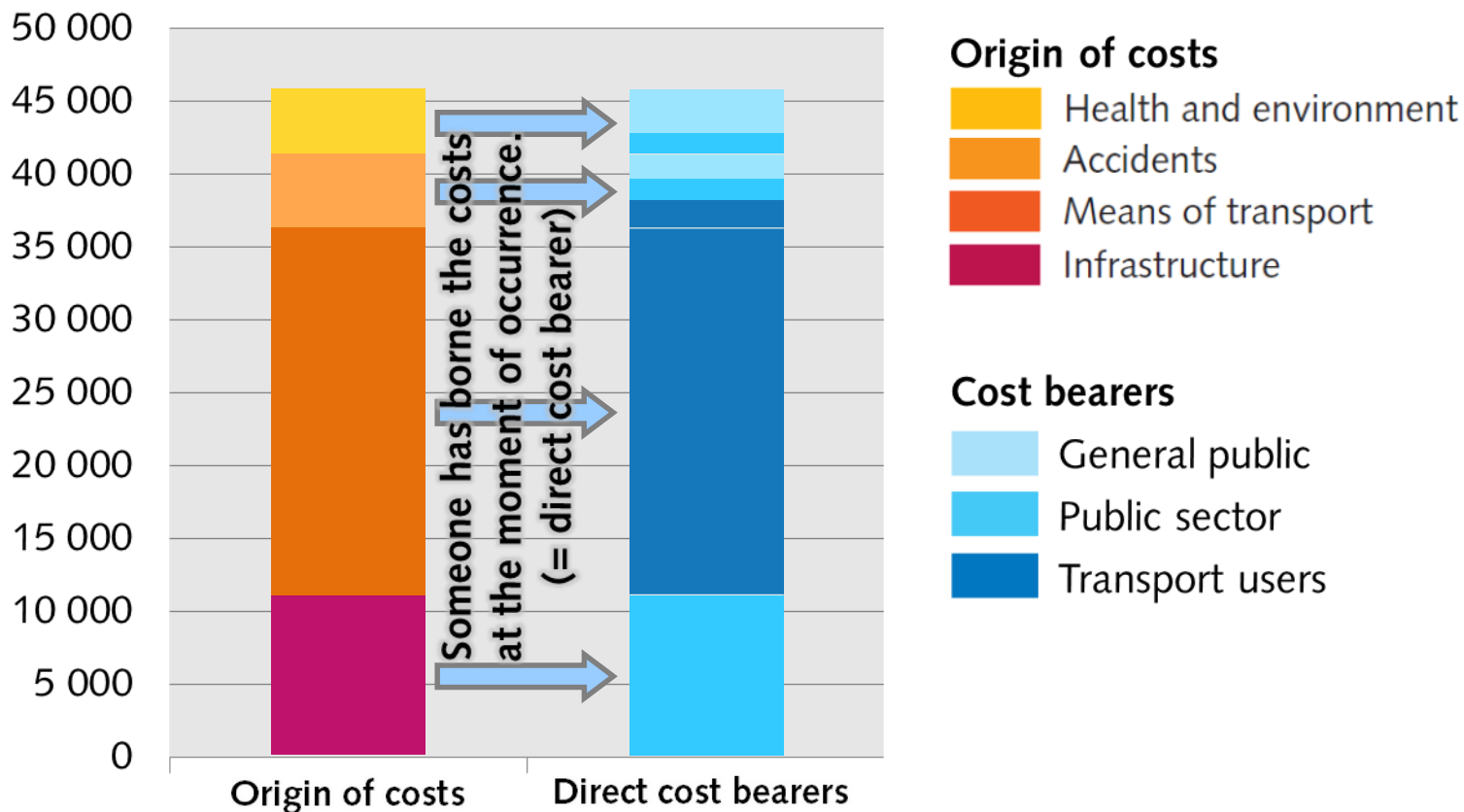
#### Step 1: Calculation of costs by origin





# 3. Three-step model

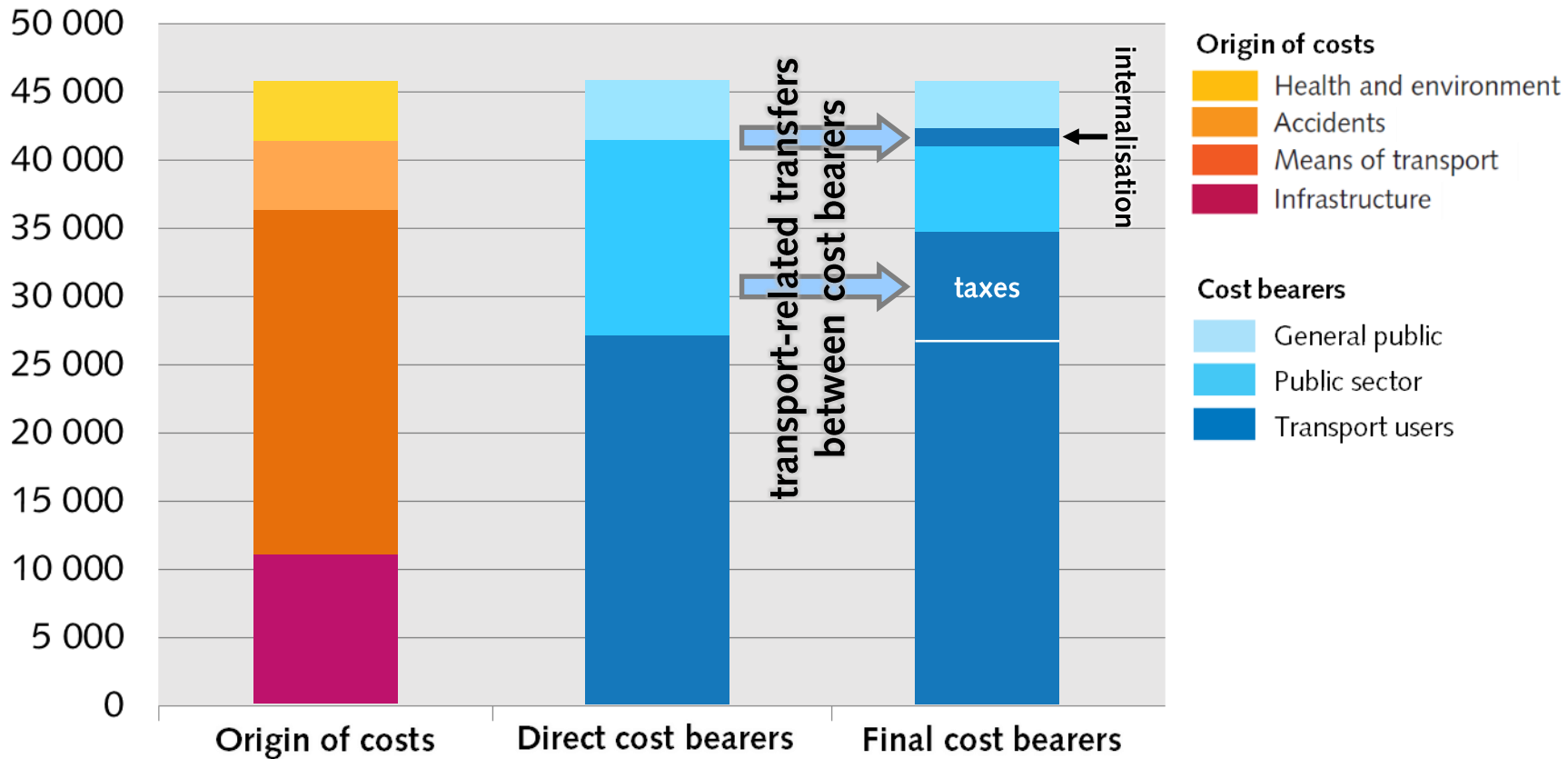
## Step 2: Allocation of direct cost bearers





### 3. Three-step model

#### Step 3: Consideration of transfers between cost bearers

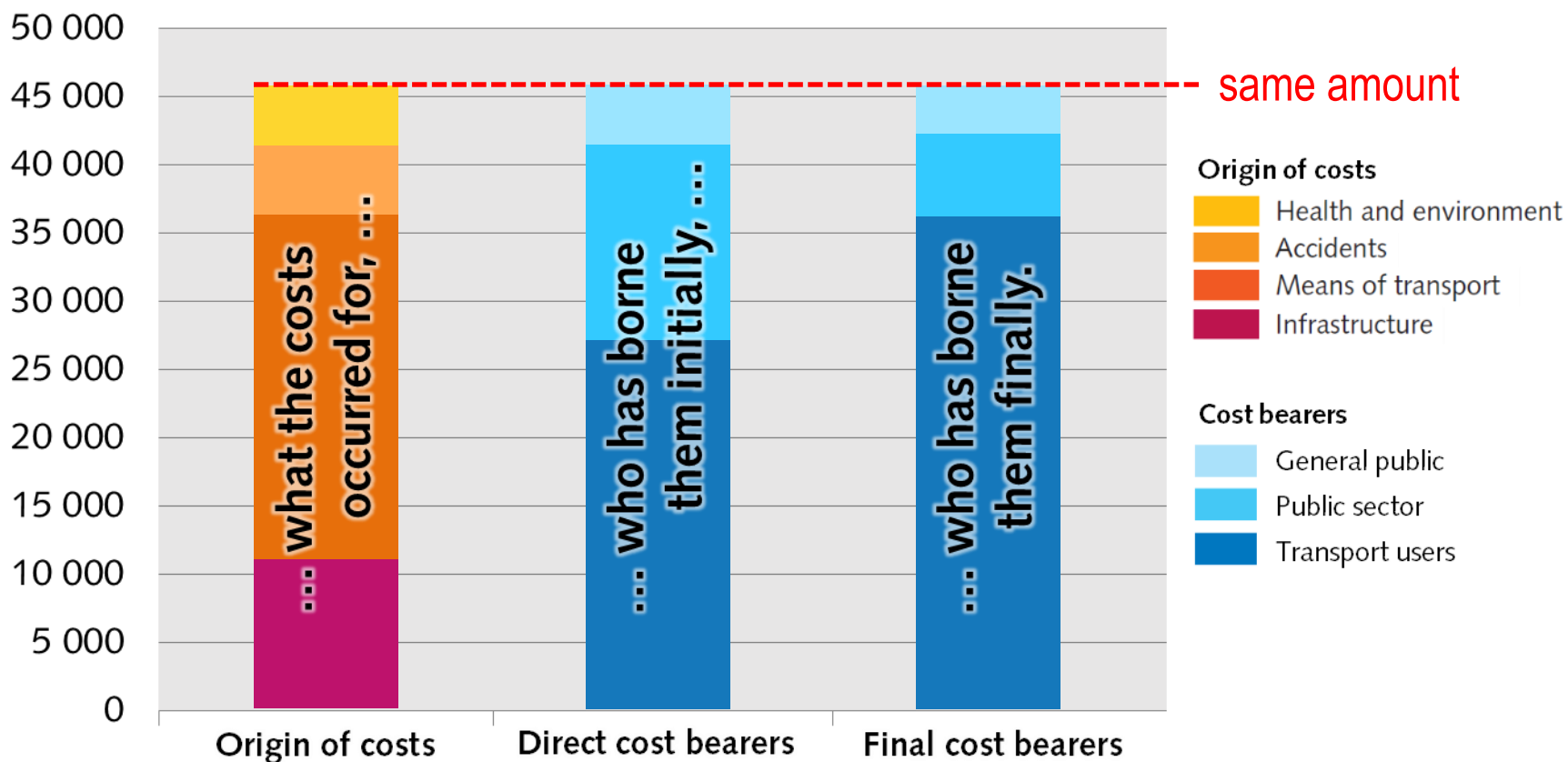




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### 3. Three-step model

Summary: CFT shows ...



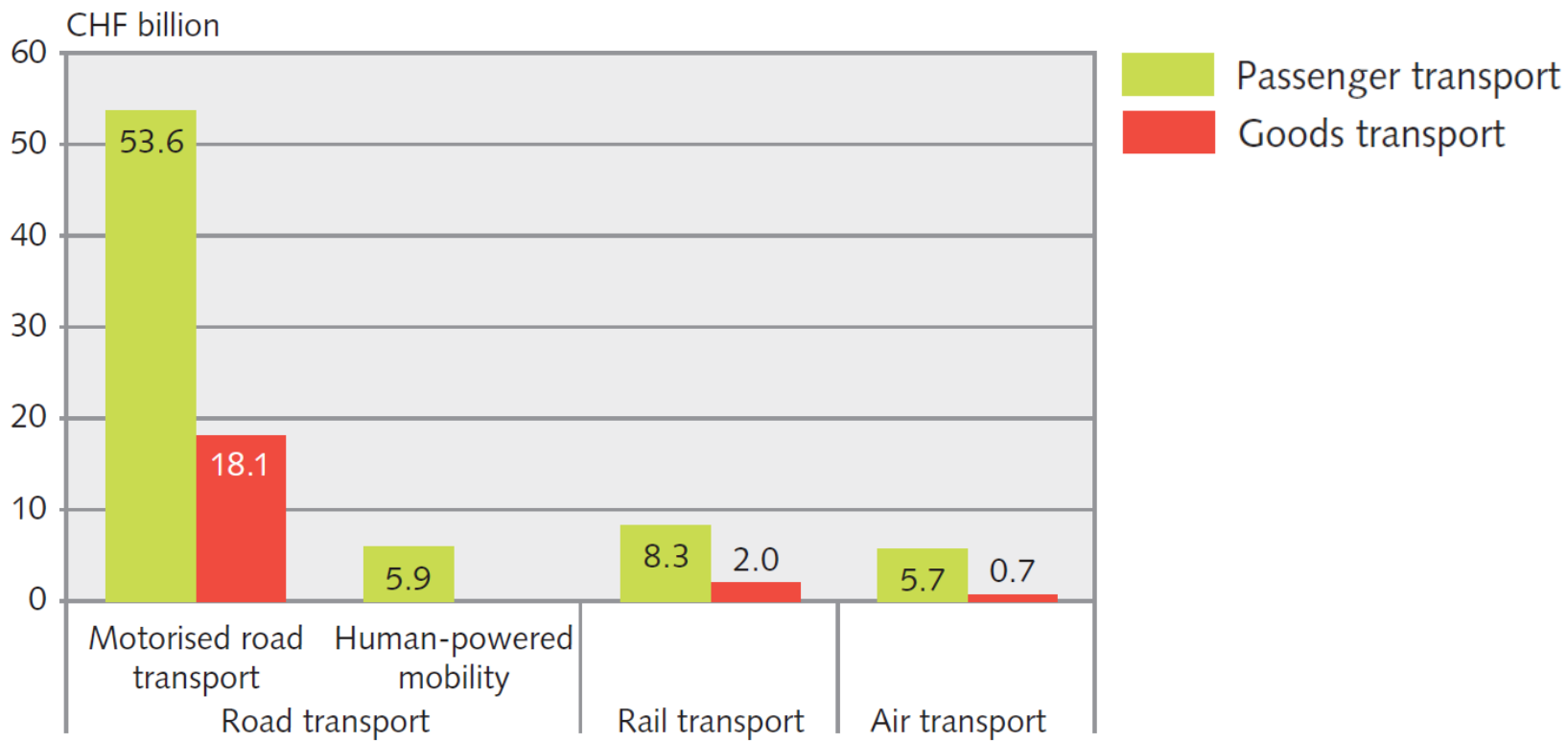
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## 4. Results

### Costs of passenger and goods transport by transport mode, 2010



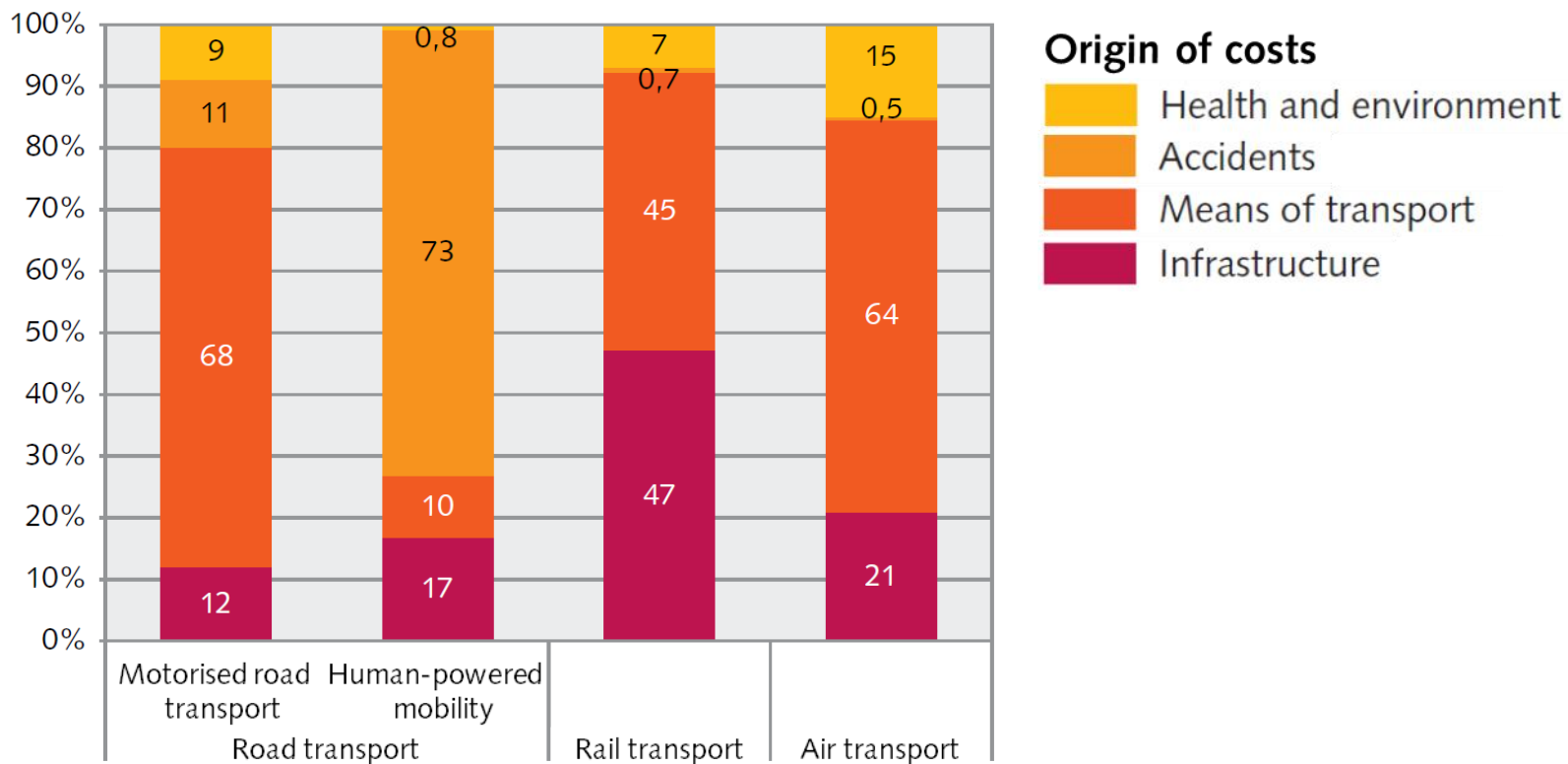




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## 4. Results

### Costs of transport by transport mode and origin of costs, 2010

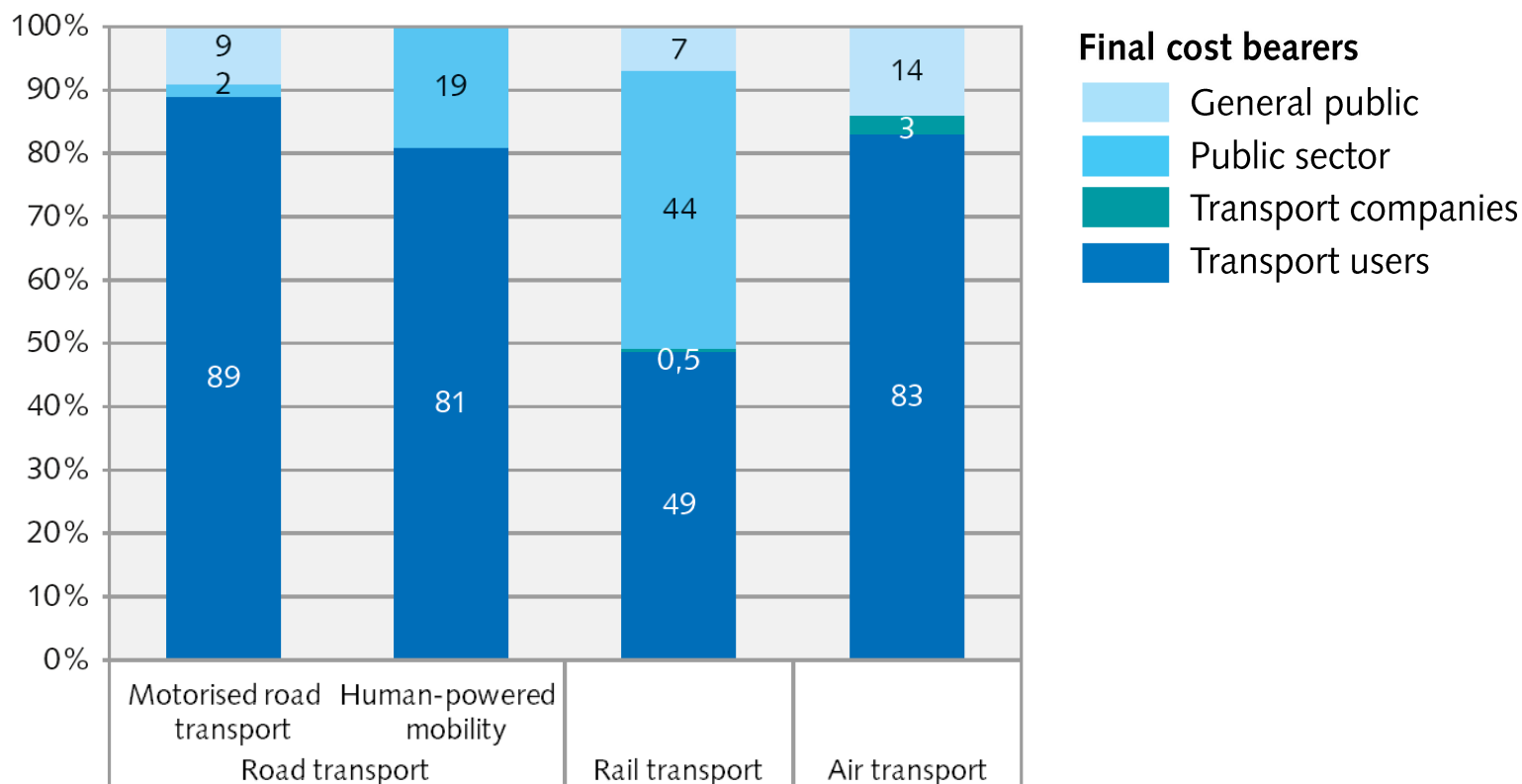




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# 4. Results

## Final cost bearers by transport mode, 2010

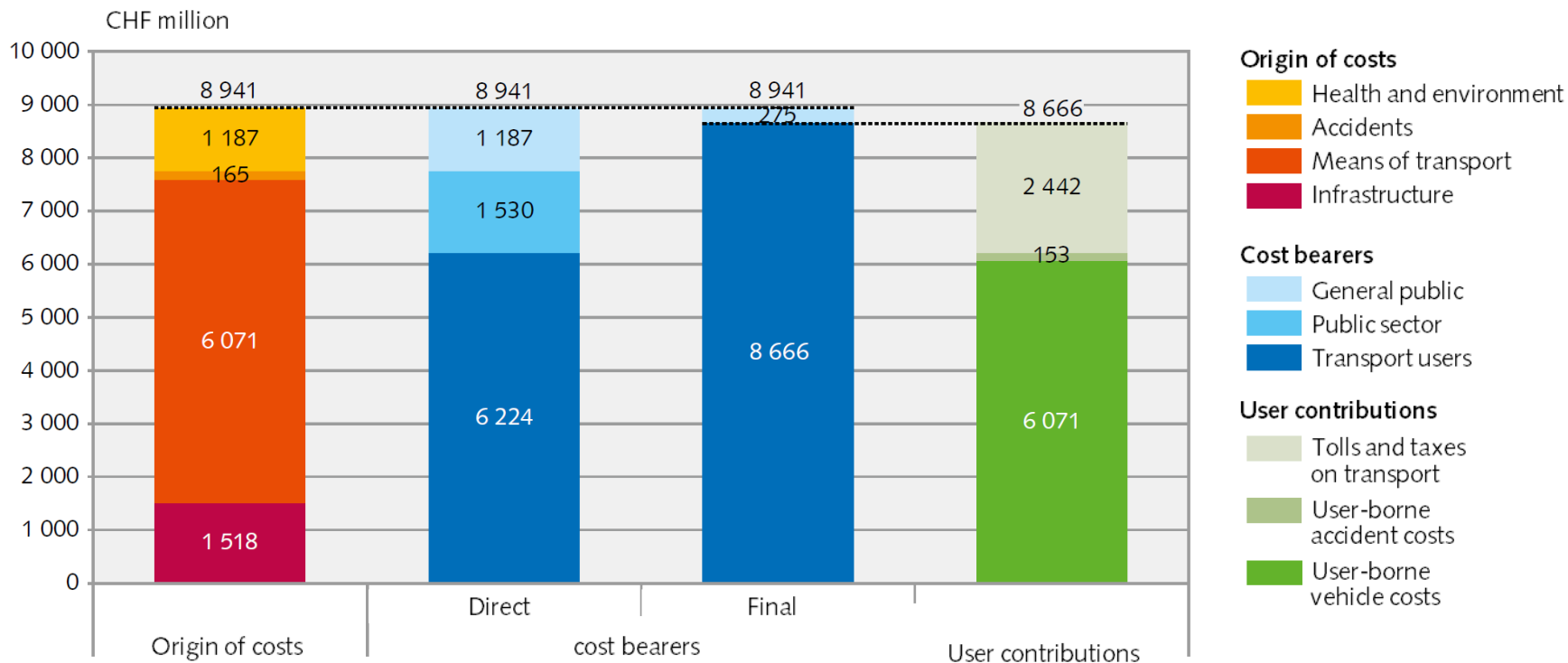




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# 4. Results

## Example for detail results: Road, heavy freight transport vehicles, 2012

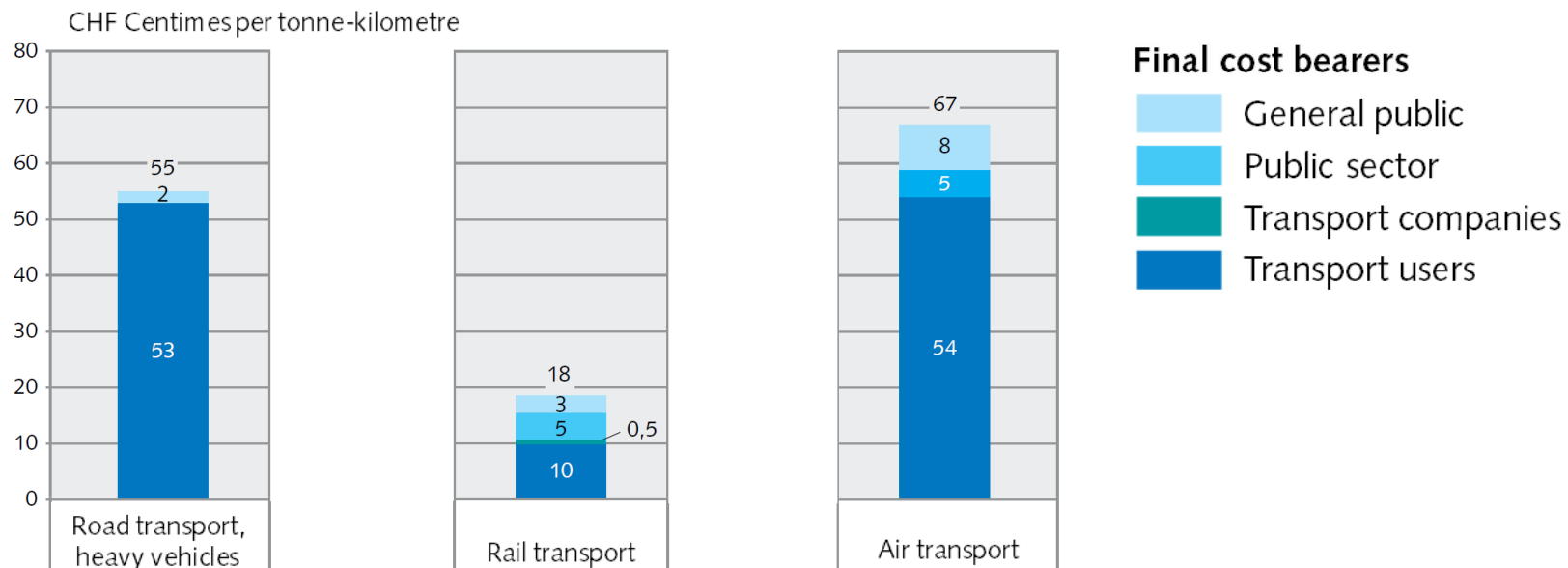




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## 4. Results

### Kilometre costs of goods transport by final cost bearers, 2010

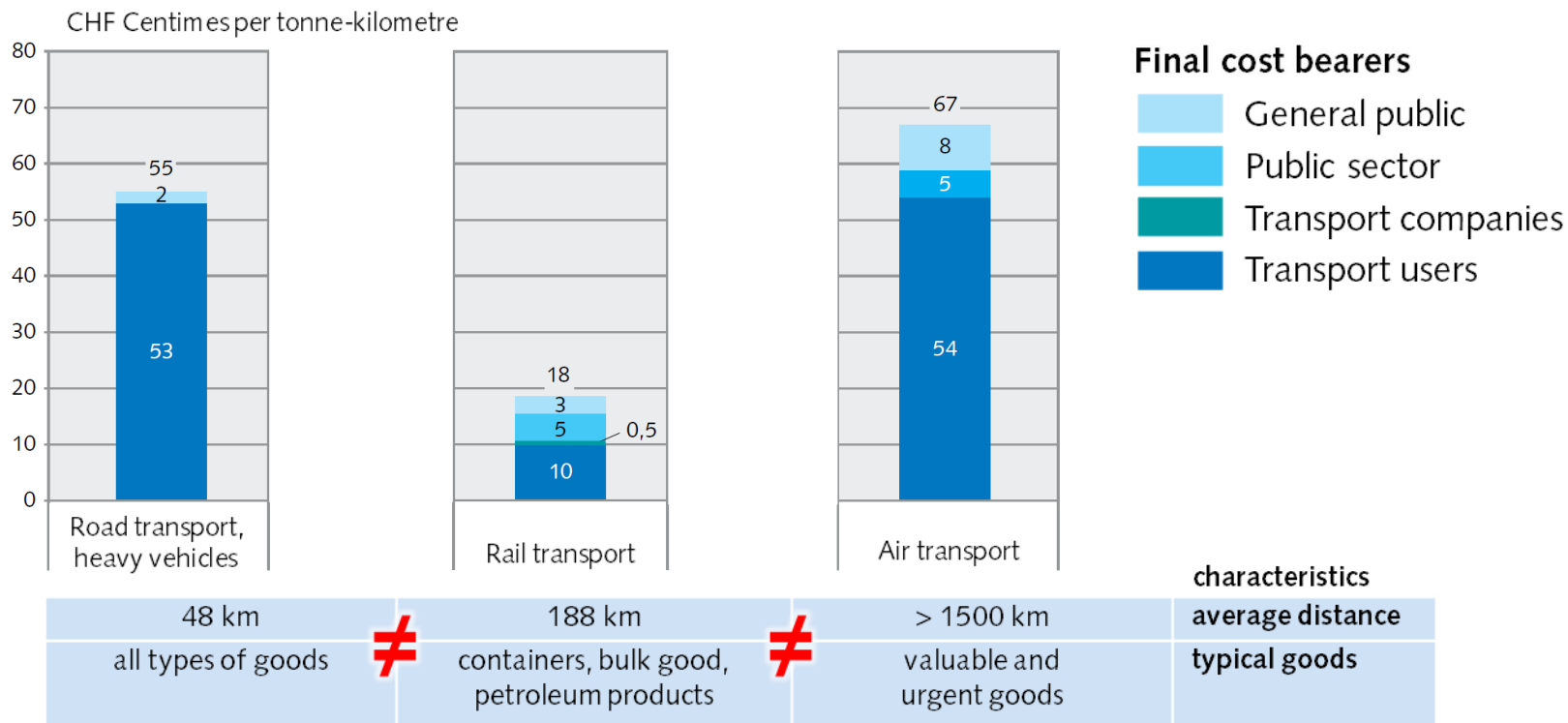




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# 5. Interpretation constraints

## Kilometre costs represent the average road, rail or air transport



**An average road or air transport cannot be carried out by rail at the average kilometre costs of rail transport.**



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## 5. Interpretation constraints

Kilometre costs are theoretical values

### 'The average car trip'

- Vehicle: average car
- Infrastructure use: Average use of motorways, country roads and urban roads
- 'A tiny bit of an accident'
- Occupancy: driver + 0.6 passengers







## 5. Interpretation constraints

Modes of transport cannot always be substituted for one another

*'How to get to the bus stop. Should I take the plane?  
It's cheaper – according to official statistics.'*



### Kilometre costs, 2010

Walking: 56 ct./pkm

Plane: 18 ct./pkm

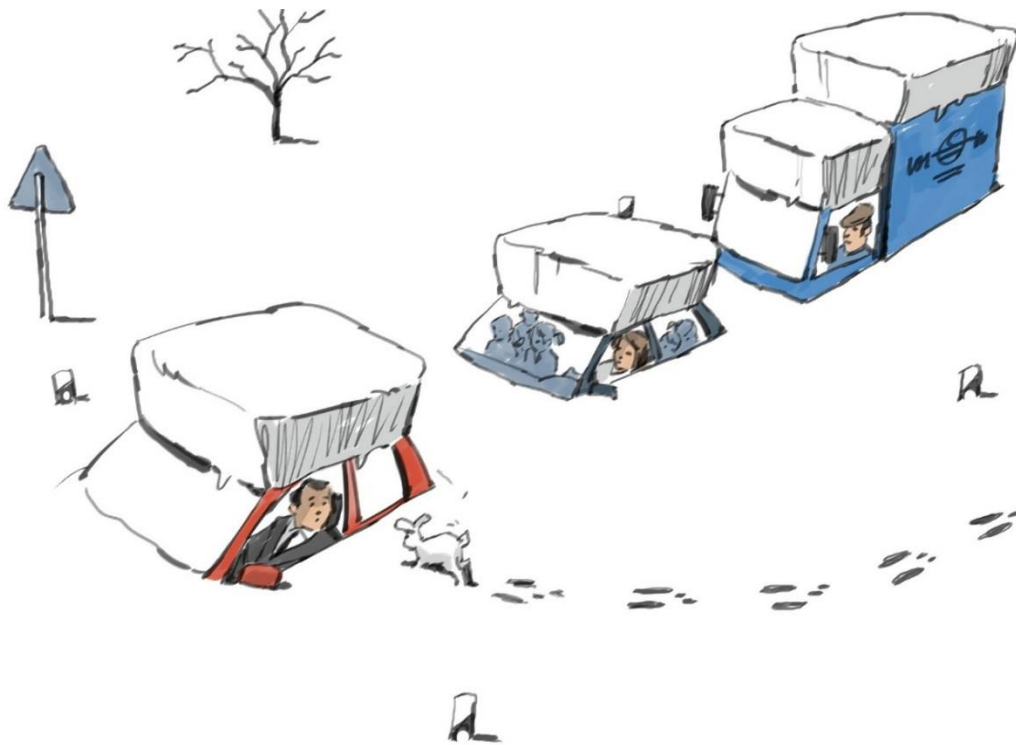
**lower costs ≠ better**



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## 5. Interpretation constraints

Social costs are not the only effect of transport



**Do not forget the socio-economic benefits of transport!**



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## 6. Outlook

	Periodicity of publications
Motorised road transport	annual
Rail transport	annual
Human-powered mobility	5 years
Civil aviation	5 years

### Planned developments

Integration of transport on inland waterways

### Further Information

[www.bfs.admin.ch/bfs/portal/en/index/themen/11/02.html](http://www.bfs.admin.ch/bfs/portal/en/index/themen/11/02.html)

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