

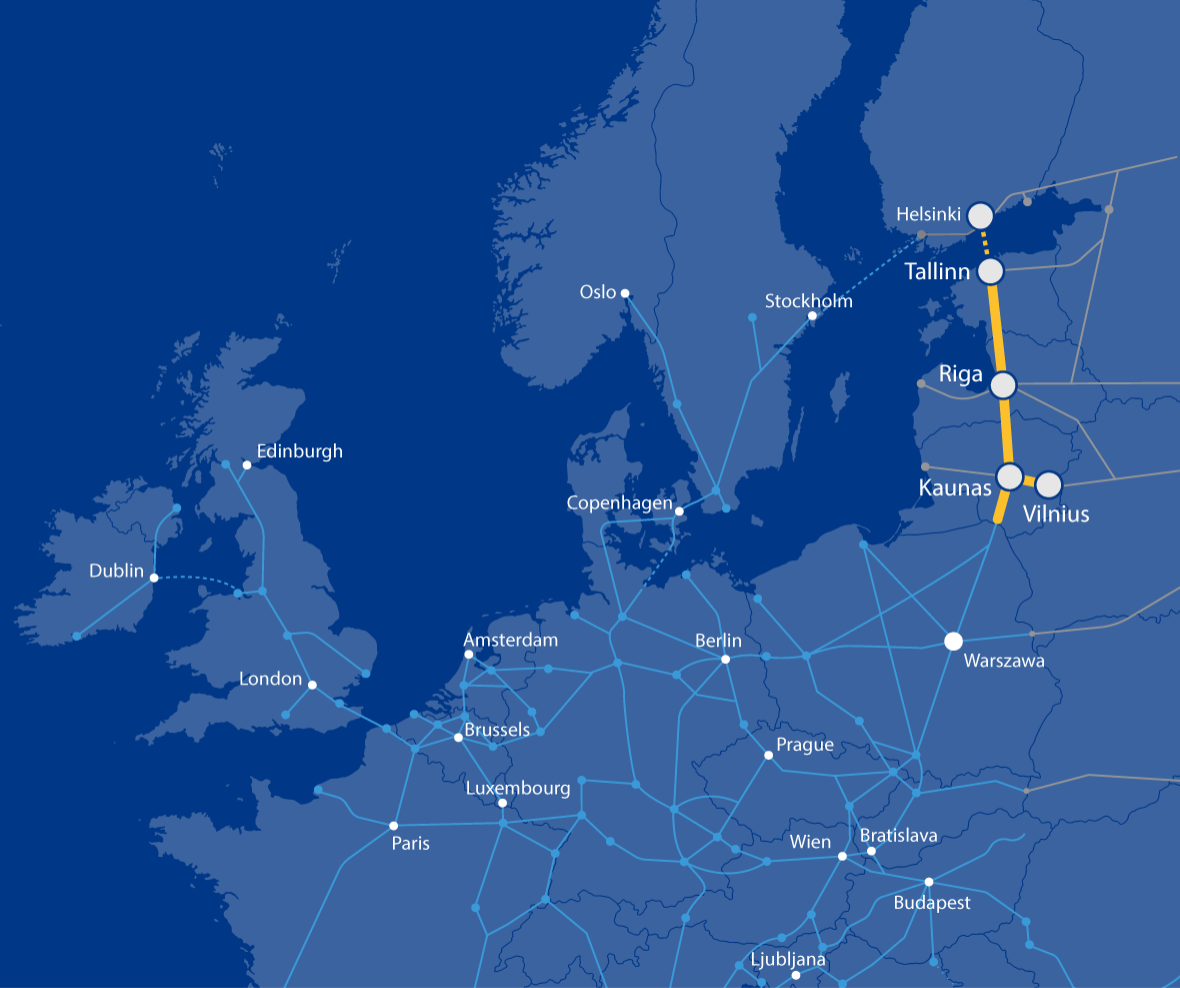


Challenges

Risks

Strategy

on Geodetic/Surveying topics



Co-financed by the Connecting Europe  
Facility of the European Union



International Locomotive of:

- **Culture**
- **Knowledge**
- **New Technologies**
- **New Methodologies**



Main Goals:

- **Safety**
- **Comfort**



## Project wise

- Total Length 870Km
- Max Speed 249Km/hour
- Crossing 3 countries, connecting to a 4<sup>th</sup>
- Duration

Table B.6 — Alignment – *AL* – Standard deviation

Speed (in km/h)	Standard deviation (in mm)
	<i>D1</i>
$V \leq 80$	1,5 to 1,8
$80 < V \leq 120$	1,2 to 1,5
$120 < V \leq 160$	1,0 to 1,3
$160 < V \leq 230$	0,8 to 1,1
$230 < V \leq 300$	0,7 to 1,0

## Geodesy/Surveying wise

- *4 different Datums*
- *High Accuracy requirements*
- *Sections under design or construction spread in time*
- *Particularity of soil*



**Table B.4 — Longitudinal level –  $AL$  – Standard deviation**

	Standard deviation (in mm)
Speed (in km/h)	$D1$
$V \leq 80$	2,3 to 3
$80 < V \leq 120$	1,8 to 2,7
$120 < V \leq 160$	1,4 to 2,4
$160 < V \leq 230$	1,2 to 1,9
$230 < V \leq 300$	1,0 to 1,5

**Table D.2 — Limit values for the measurement uncertainty of the track geometry parameters**

Measurement uncertainty [mm]			
Track geometry parameter	Wavelength range		
	<i>D1</i>	<i>D2</i>	<i>D3</i>
Track gauge	±1		
Longitudinal level	±1	±3	±5
Cross level	±3		
	relative value (difference of successive cross level values) to be used for the twist calculation ± 1		
Twist (When twist is expressed as a ratio this value shall be divided by the base-length)	±1,5		
Alignment	±1,5	±4	±10

## Human Resources wise

- *Field working people minimizing*
- *Limited experience in such Projects*
- *Transition between 2 generations*
- *Time – Cost – Quality triangle*







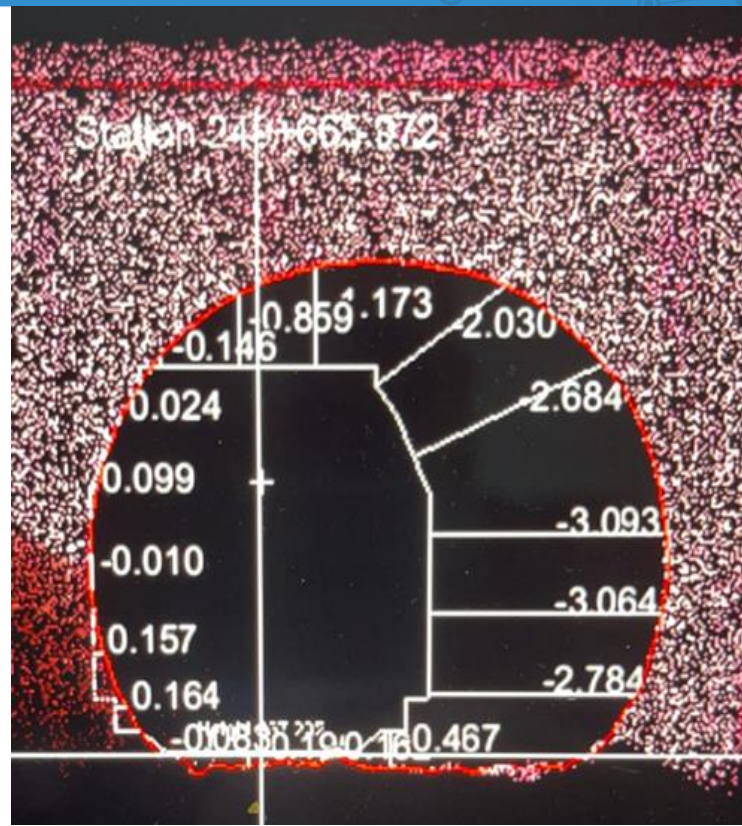
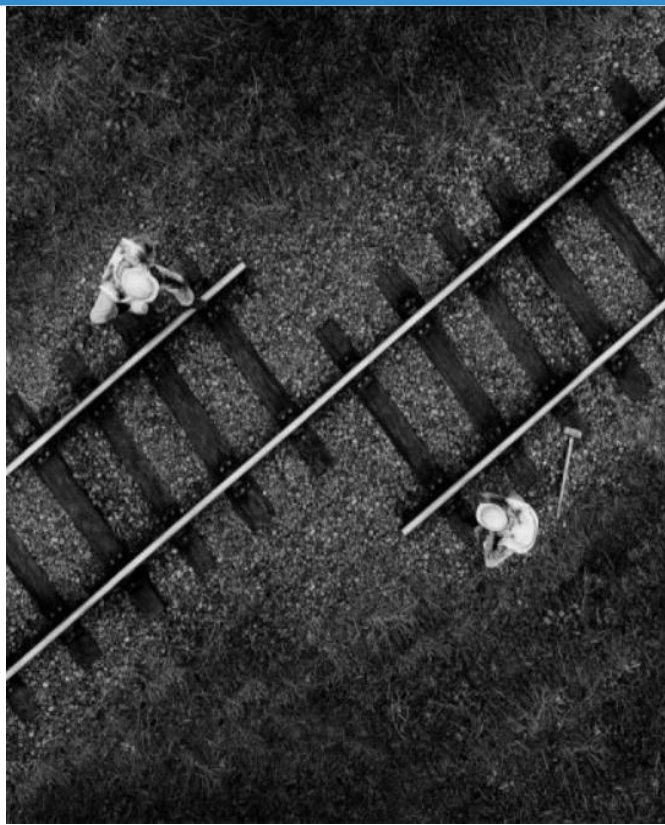
**Roads and railways swept away after Austrian floods**

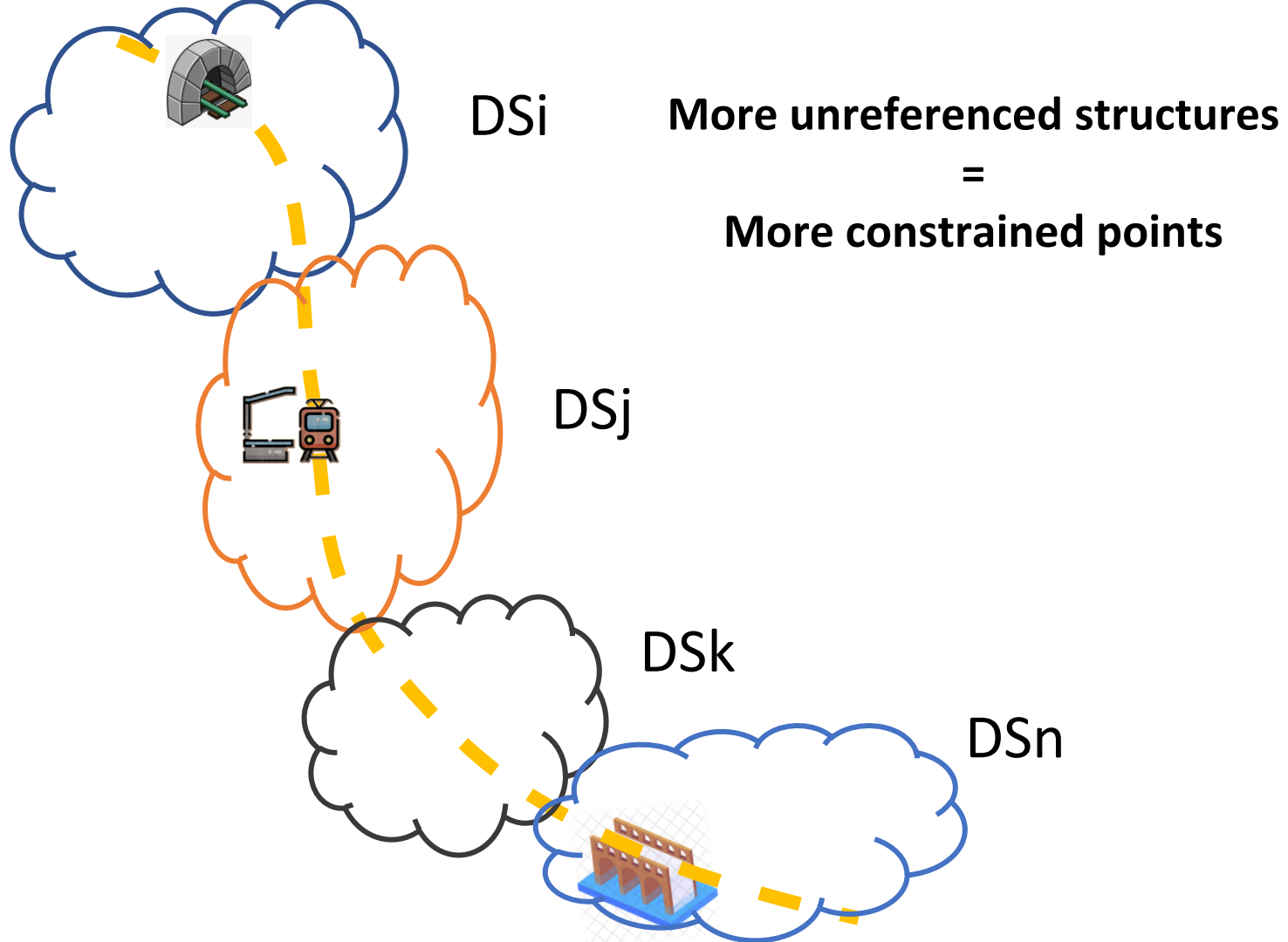
## Unpredictable factors wise

- *Climate Change*
- *Pandemic*
- *War*
- *Financial Crisis*
- *Prices raise*



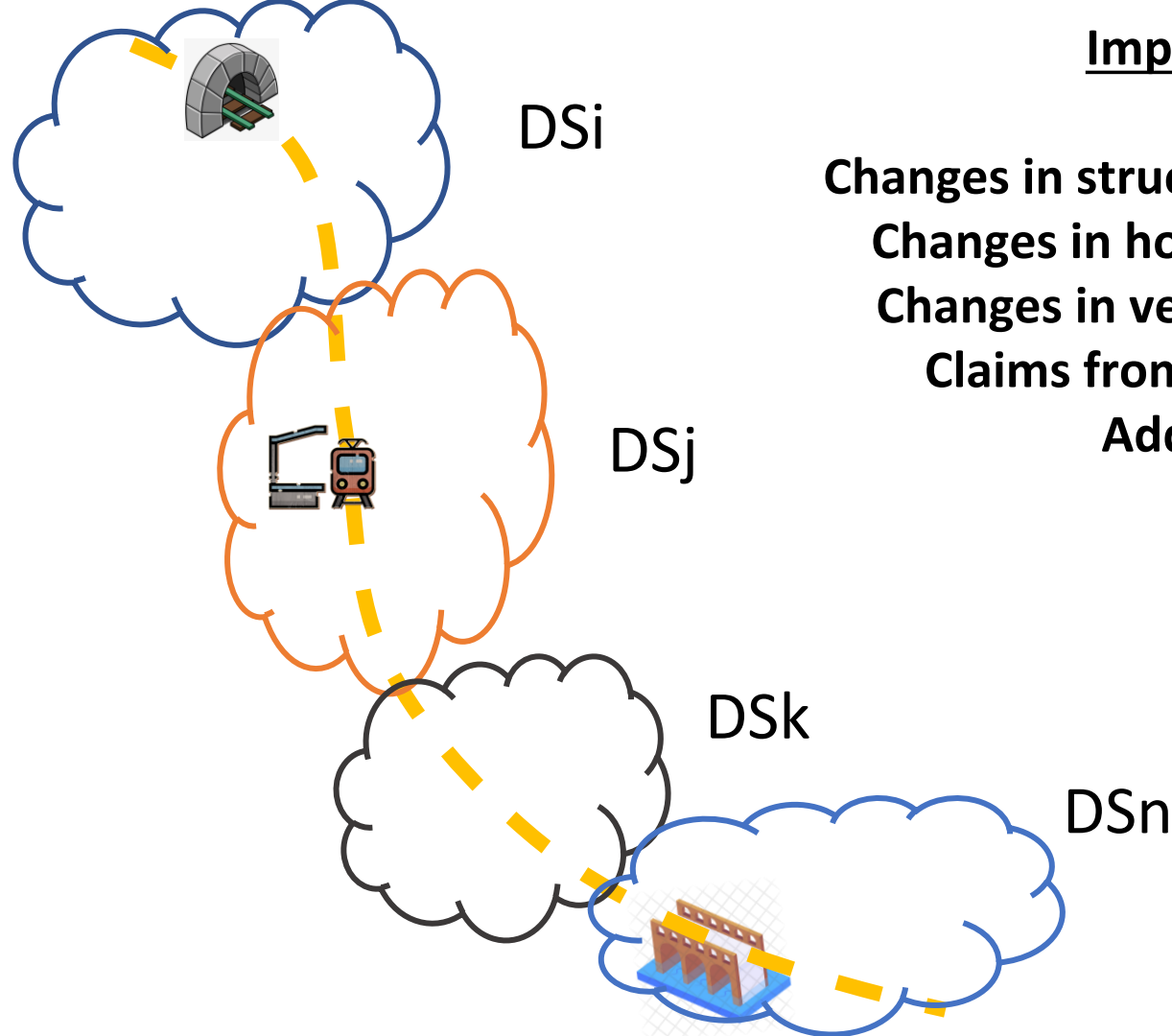








## Impacts of Risks:



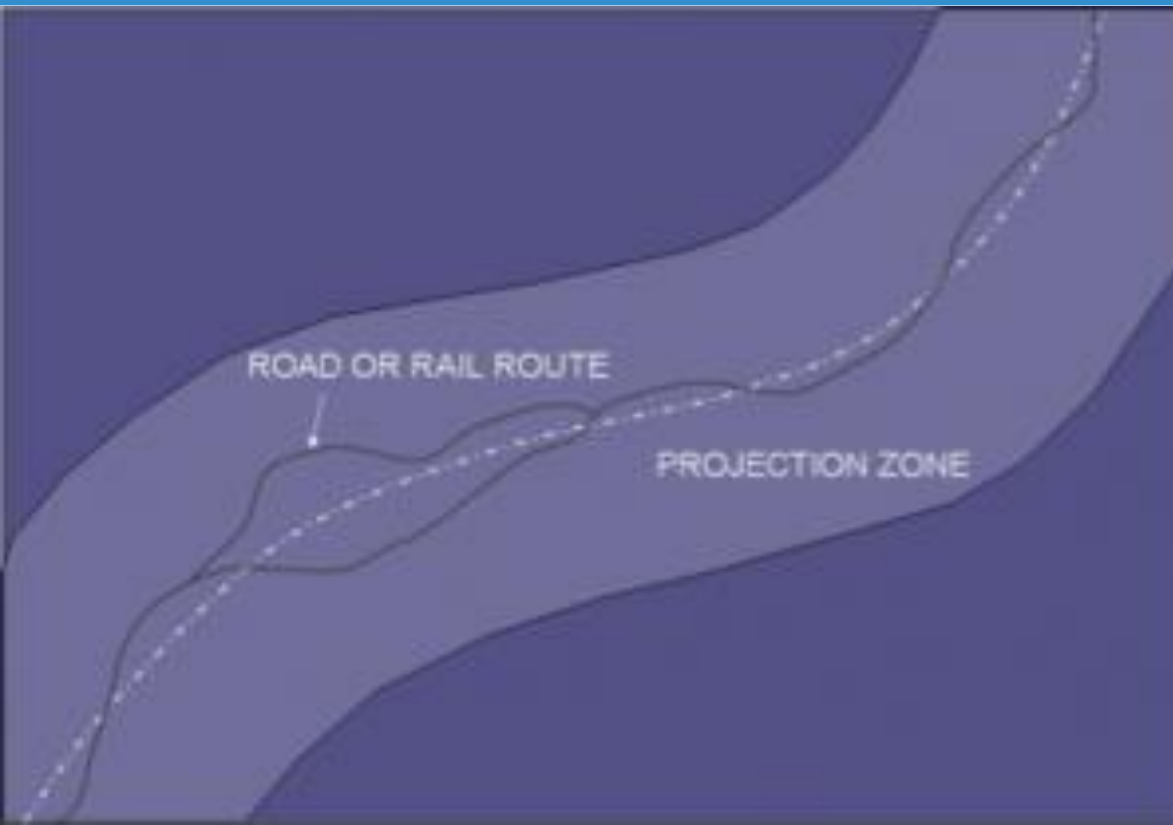
**Changes in structures design**  
**Changes in hor. Alignment**  
**Changes in ver. Alignment**  
**Claims from contractors**  
**Additional costs**  
**Time Delays**



## Main Goals :

- *Correct Geometry*
- *Required Accuracies*
- *Smooth working*
- *Durability*





## How ?

- *Dedicated Unified Network*
- *Snake Grid Projection*
- *Technical Specifications*
- *Respect of Rules & Norms*
- *Helping Surveyors in action*



## Means ?

The factors that need to be overcome are:

- Lack of people
- *Modern managers' main target is more to horizontally minimize the costs than to profit by increasing productivity*

**Both lead to lowering of quality or time extension, but....**

- *Quality is not negotiable*
- *Time in War Era became not an option*



## Can we ?

- *Installing monuments with forced centering plates minimize use of CPs.*
- *High-end and performance equipment*
- *Modern Techniques and methodologies*
- *Analytical description of tools and workflows in the Technical Specifications of the Contracts, **to be fully respected.***



## Can we ?

- *Central management of geodetic control points database, during the whole life of the Project.*
- *CP's ID*
- *Coordinates in all datums*
- *Date of construction*
- *Date of control/remeasurement*
- *New coordinates*
- *Densification or replacement*
- *Etc.*





- *Surveyors' work will get the respect it deserves in all aspects, technical, mental and financial.*
- *Rail Baltica Project will function as an Academy for the current and future generations of surveyors in the Baltics.*
- *Ensuring the continuity of good quality transportation services during operational period*
- *A safe and comfort railway line, smoothly connecting EE, LV, LT with the rest of Europe*



Thank you for your attention

