



Transport of dangerous goods Mitigation instruments



INTERREG IVC
INNOVATION & ENVIRONMENT
REGIONS OF EUROPE SHARING SOLUTIONS



EUROPEAN REGIONAL
DEVELOPMENT FUND



Dordrecht Junction of Infrastructure

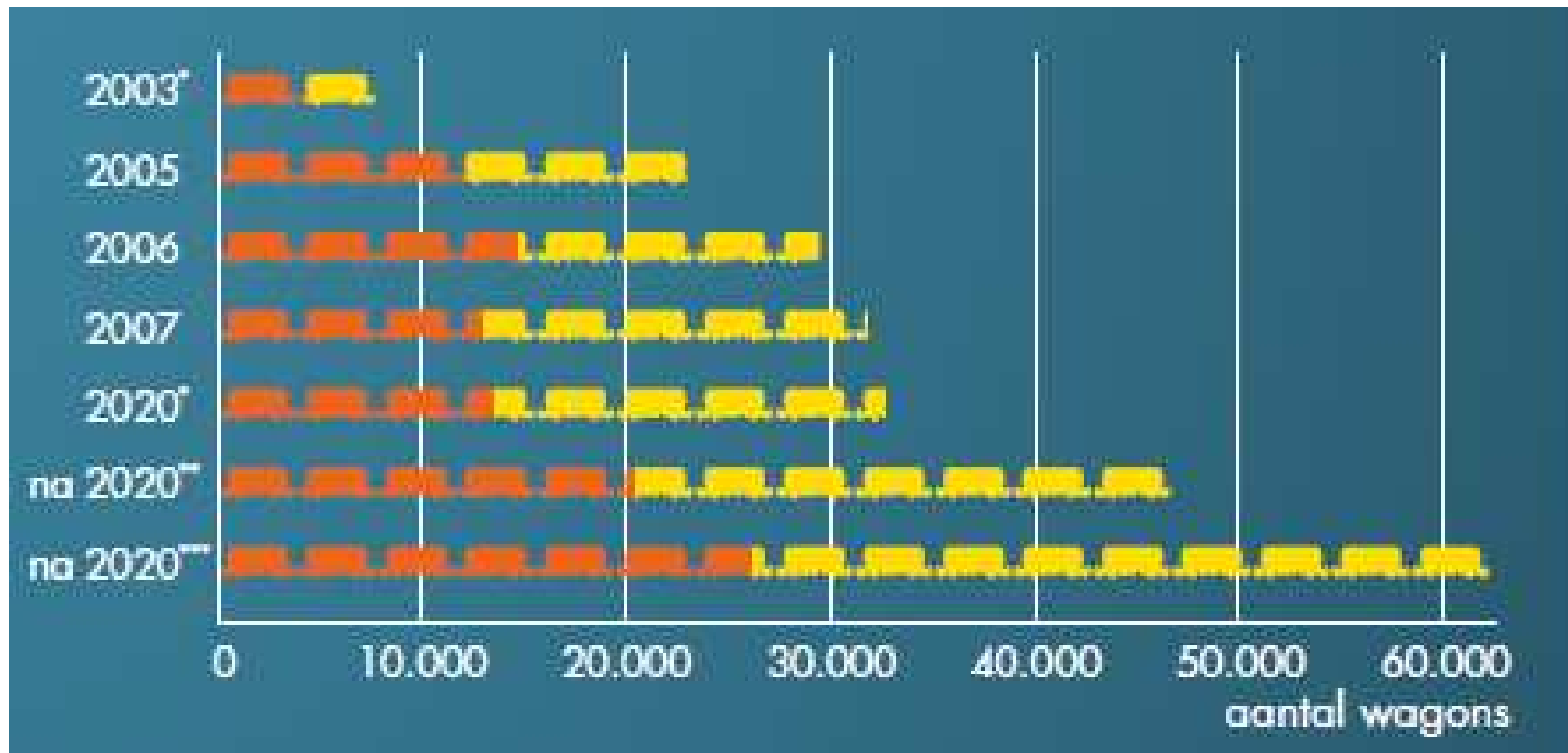
- **Roads:**
 - A16 (Rotterdam- Belgium)
 - N3 (Tunnel bypass for dangerous goods)
- **Railroads**
 - Rotterdam Germany / Belgium
- **Waterways**
 - Rotterdam Germany / Belgium



Railroads used for transporttation of dangerous goods



Facts and figures



carriages flammable gas transported through the Drechtsteden

carriages Inflammable liquid transported through the Drechtsteden



Mitigation instruments (First layer)

National:

- **Finding new route to Germany south of the Netherlands**
- **Risk reduction by adjusting train composition**
- **Improving train safety systems**





Mitigation instruments (second layer)

- **Spatial designs based on the effects of different incident scenarios**
 - **Zoning**
 - Use of space
- increasing density of people
 - **Escape routes**
 - **Reduction of intervention time by:**
 - Improvement accessibility industrial areas
 - Improvement accessibility infrastructure
 - **Exlcuding vulnerble objects within 200 meters from railroad** (hospitals, homes for elderly, kindergarten)





Mitigation instruments (second layer)

- Local safety improvements to the railroad
 - Derailment prevention
 - Containment combustible liquids

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Mitigation instruments (third layer)

Improvement accessibility (rail-)road

- Improvement capacity fire brigade:
 - Reduction of intervention time
 - Extra fire engines
 - Sufficient water supply
- SMS alert for inhabitants Leerpark
- Buildings adapted to some scenarios:
 - Fire
 - Toxic releas



The case

School area

Housing area

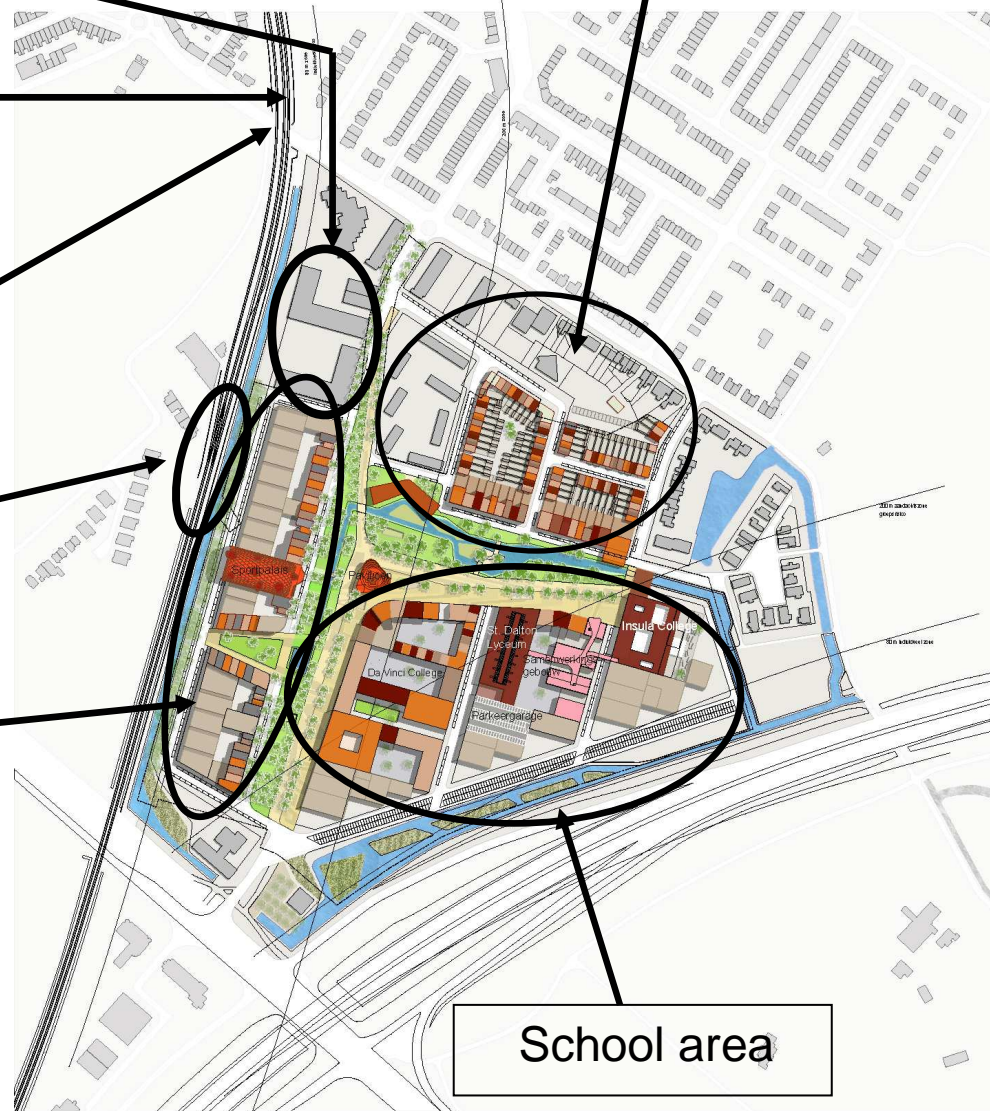
Railroad: 18000 carriages
flammable gas

Railroad: 21000 carriages
flammable liquids

Reduction point
amount of tracks 3 - 2

business area

School area



The case



possibility of new railway to southern Netherlands



The questions

- **Do you see opportunities for improvements to the railway?
(first layer)**
 - What do you have to do? Locally, regionally, nationally
- **Do you see possibilities for improving urban design?
(Second layer)**
- **Do you see opportunities for improvement in the ability of
the firebrigade to combat an incident?
(Third layer)**

