Urban development and External safety

Dordrecht, 19 June 2008
Introduction: Dordrecht

- Largest city of the Drechtstedenregion
- Dordrecht: 120,000 inhabitants
- Drechtstedenregion: 250,000 inhabitants in total
- Oldest city of Holland (dates from 1220)
Historical centre of Dordrecht
Dordrecht: junction of infrastructure

- Roads:
  - A16 (Antwerpen – Gent, Zuid-Europa)
  - N3 (Tunnel bypass for dangerous goods)
- railroads
  - Rotterdam Germany / Belgium
- Waterways
  - Rotterdam Germany / Belgium
Ambitions Dordrecht/Drechtsteden

- Economic, intensive and sustainable use of the available space
- Compact urban areas with high quality living environments
- Reinforcement of the economical potential
- Improvement of environmental conditions
  - External safety
  - Air pollution
  - Noise pollution
external safety will interfere with the intended urban development
Impressions of the intended development
Ambitions for External Safety

• Zoning of infrastructure
  – Water: 25 meters
  – Road (N3): 80 meters
  – railroad: 50 meter

• Societal Risc
  – as low as reasonably achievable (ALARA)
  – Different risk levels for different places
    • City centre
    • Intermediate area’s
    • Suburban area’s
Ambitions for External Safety
Differend risk levels for differend places

Legend
- Centrum wonen
- Stedelijk wonen
- Suburbiaan wonen
- Stedelijk groen
- Buitenstedelijk groen
- Agrarisch gebied
- Natuurgebied

Legend externe veiligheid
- 0 < gr < 0.5
- 0.5 < gr < 2.0
- 2.0 < gr

Kantoren
Bedrijven
Industrie
Snelweg/hoofdweg
Spoor
Stadsring
Doorstroomweg gemeentelijk
Use of risk-assessment in urban development

Comparison of different spatial models
Restructuring The Educational Park (Leerpark)
Objectives Leerpark

- Improvement of the spatial quality of the Leerpark area
- Intensify the use of the Leerpark area
- Improvement of the safety situation
Program: Leerpark

- 65,000m² educational institutions
- 27,000m² commercial properties
- 250 houses

Investment
- €200 miljon (totaal)
Improvement of the safety situation (1)

- reducing the risks of transport of dangerous goods to an tolerable level by spatial planning:
  - Individual risk
    - No buildings within 10-6 contour
      - Oversized zoning N3: 80 meters (including space for future transport)
      - Oversized zoning the railroad 50 meters (including space for future transport)
    - Replacing the level crossing by a tunnel
Improvement of the safety situation (2)

• Societal risk
  – Reduction of Societal risk levels by using risk assessment in spatial planning
    • Assessment of different spatial designs
    – Replacing the level crossing by a tunnel
    – Removing a school near the N3
Improvement of the safety situation (3)

- Other measures
  - Improvement accessibility (rail-)road
  - Improvement capacity fire brigade:
    - Reduction of intervention time
    - Fire engines
    - Sufficient water supply
  - Excluding vulnerable objects within 200 meters from railroad (hospitals, homes for elderly, kindergarten)
  - SMS alert for inhabitants Leerpark
  - Buildings adapted to some scenarios:
    - Fire
    - Toxic release
Improvement of the safety situation (4)

Design principle
Difficulties

- Insufficient zoning railroad
  - caused by unexpected growth of transport
The future

- "Short term" measures
  - Better train safety systems
  - Slower train speed (<40km/h)
  - Reduce chance BLEVE by altering train composition
  - Improved spatial planning by using risk-assessment

- Long term measure
  - A separate dedicated goods transport line avoiding the urban area (port of Rotterdam – Antwerp)