Evolution of Roundabouts
Why Turbo Roundabouts?
Why Turbo Roundabouts?

- Single lane roundabouts introduced in the eighties in the Netherlands
- With the increase of traffic volumes, single lane roundabouts replaced by multilane roundabouts
- Standard multilane roundabout has safety issues: weaving conflicts
Why Turbo Roundabouts?

- **Challenge:** design a layout which eliminates the safety conflicts and increases capacity
- **Result:** spiral shaped Turbo Roundabout without lane changing on the roundabout
- **Why the name Turbo Roundabout?** Refers to the improved traffic flow (compared to a standard multilane roundabout)
Turbo Roundabout Basics
Turbo Roundabout Basics

Turbo Roundabout characteristics:

• No lane changing on the Turbo Roundabout
• Lane choice upstream Turbo Roundabout
• Spiral layout
• Radial approaches

© CROW Guideline: turborotondes
Design

Number of entry lanes

- 1, 2 or 3 entry lanes is common
- Some with up to 7 lanes
Design

Number of exit lanes

• One or two
Design

Radial Design

- Smaller crossing than most in the US
- Signage in front of driver is important
- Use on low speed and high speed approaches
Traffic safety

Design philosophy:

- A safe design by geometry
- Radial design results in:
  - Short crossing distance to the middle lane of the Turbo Roundabout
  - Small conflict area
  - Good sight lines (don’t need to look over the shoulder)
- Low speeds on the Turbo Roundabout and a short crossing distance are also beneficial for capacity!
Design

Lane separation

- Elevated separation

1.5 inch
1.2 inch
2.7 inch
11.8 inch
Bikes and Peds
Perceived Challenges in the US

- Radial approaches
- Trucks
- Snow plowing
- Motorcycles
- Drainage
Trucks

- This truck: 82.8 ft
- Roundabout: 190 ft
Trucks

- Different type of material for trucks
- Cars stay off
Snow Plowing

- Use non-steel blade which are more forgiving to curbs.
- If possible, assign same driver to the route.
- Plow inside to outside, one approach at a time
Motorcycles

The elevated lane separation not ideal for motorcycles but:

- *Low risk of sideswipe between car and motorcyclists*
- *Low risk of motorcyclist hitting curb*

**Essential for bikers:**

- Warning signs upstream of the turbo roundabout (150 ft)
- Repeat warning signs at center island
- Not too high: 2.7” height
- Use contrasting colors
Motorcycles

Upstream

Verhoogde rijbaanscheiding

= Elevated Lane Separation

Safe to ride over

High contrast

Center island
Drainage
Turbo Roundabout Implementation in US

Steps for implementing in the US:

- Minor adjustments to fit US design vehicles
- Calibration and validation of US driving behavior (calculation sheet and simulation)
- Look at specific conditions
- Introduction of the concept: understanding of the concept by the drivers
- Monitoring and evaluation of driving behavior, traffic safety and traffic flow (capacity)
- Start with a simple turbo roundabout
Turbo Roundabout Implementation in US

Jacksonville, FL
- Review Traffic Design
- VISSIM Simulation
- 175’ ICD
Urban US Corridor

- Provides access management with 2 turbo roundabouts
- Accommodates bicyclists & pedestrians
- Smaller footprint than traditional roundabout
- In pre-planning stage
Turbo Roundabouts Interchange Middelburg (A58)
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Future Admiral De Ruyter Hospital with new connection

2022 - 2040

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Study:
- Traffic volumes
- Alternatives
- Design
- Maintenance of Traffic
Questions & Discussion

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