

Handout with additional Information

GTB Vehicle Live Demo Event: Signal Road Projection

88th GRE Session

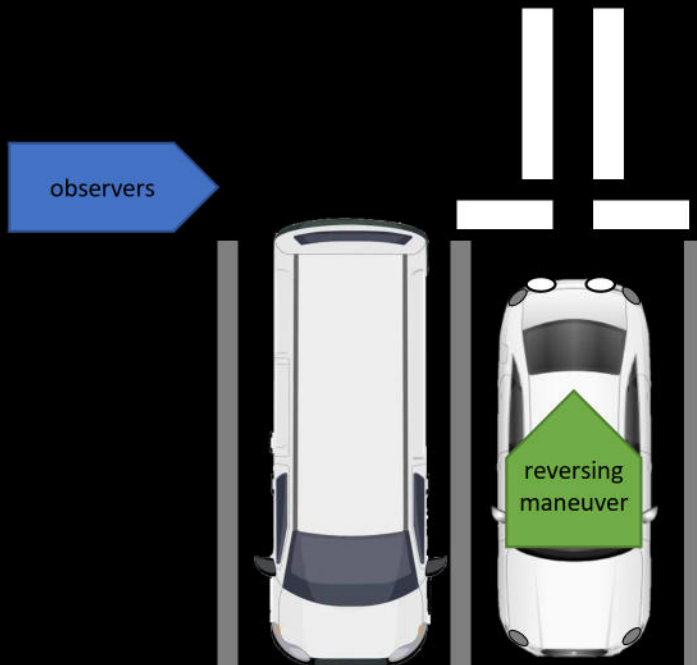
26. April 2023

Demonstrated Use Case 1: Reversing from behind a visual obstacle

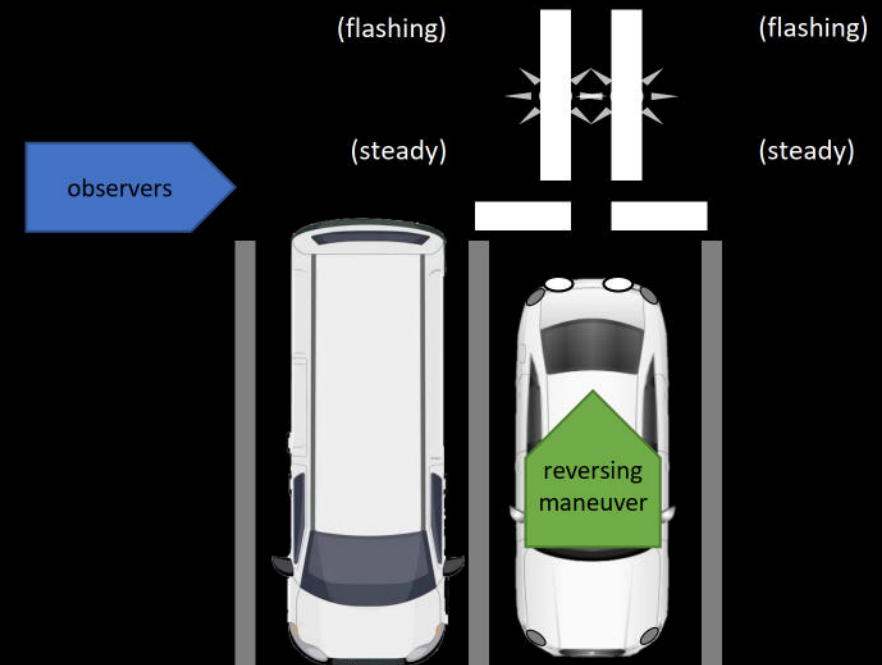
Purpose and Key Take-Away:

- 1) General demonstration of usefulness of reversing projection at parking lots, or when reversing without driver's possibility to see cross traffic
- 2) Demonstrate usefulness of flashing capability to draw attention of maneuvering vehicle

A) Steady-state rendering of reversing projection



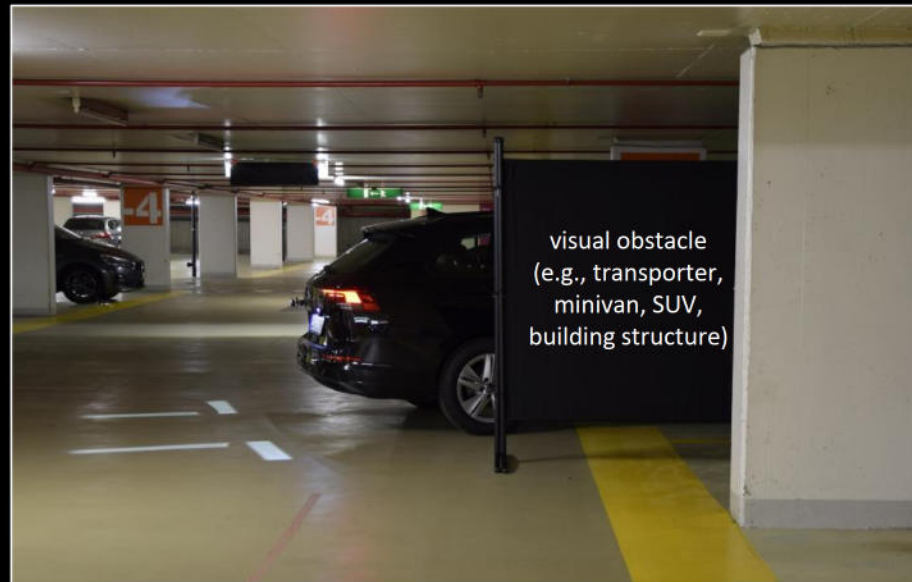
B) Partially flashing of reversing projection pattern



Demonstrated Use Case 1: Reversing from behind a visual obstacle

Purpose and Key Take-Away:

- 1) General demonstration of usefulness of reversing projection at parking lots, or when reversing without driver's possibility to see cross traffic
- 2) Demonstrate usefulness of flashing capability to draw attention of maneuvering vehicle



◀ Cross traffic is not visible for the driver of the vehicle, which is about to reverse out of the parking space behind another vehicle or wall.

The reversing projection provides useful safety information for the cross traffic. ▶



Demonstrated Use Case 2: Parking in and out of a parking space parallel to road

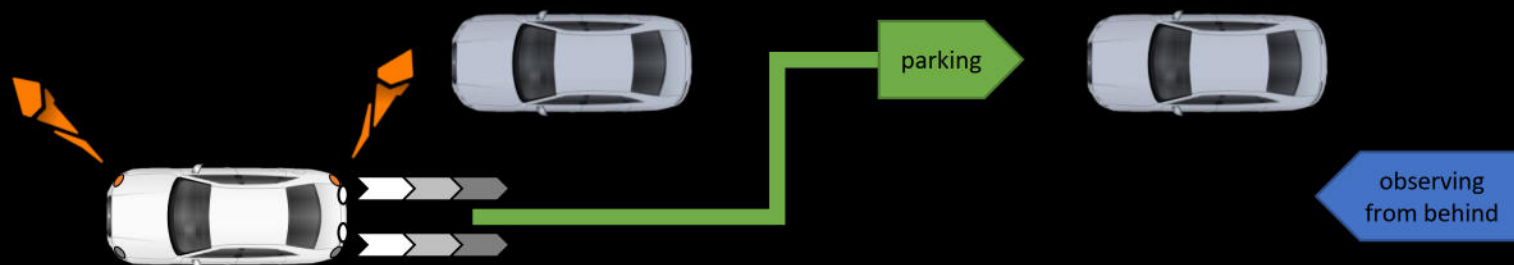
Purpose and Key Take-Away:

- 1) Demonstrate usefulness of reversing projection in combination with front and rear direction indicator projection
- 2) Demonstrate perception of a cyclist, who is being overtaken by a car
- 3) Demonstrate usefulness of direction indicator projection during parking out maneuver

Step 1:

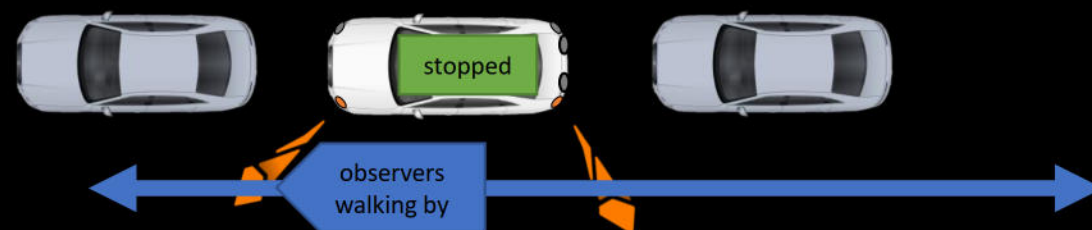
First run: Vehicle parking *without* reversing projection;
direction indicator *sequentially activated*

Second run: Vehicle parking *with* reversing projection;
direction indicator projection *flashing only*



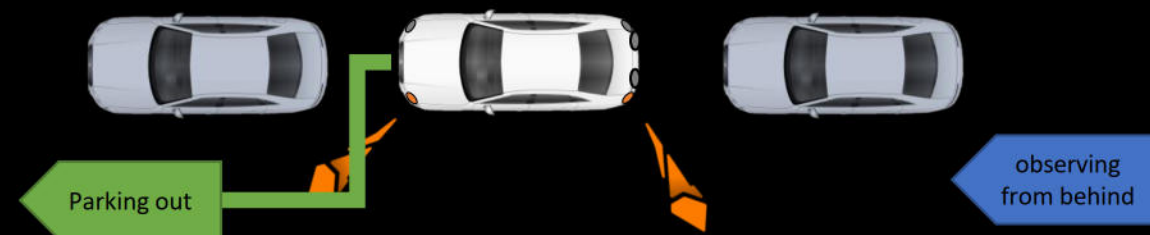
Step 2:

Both runs: Vehicle stopped with activated left-hand
direction indicator projectors



Step 3:

Both runs: Vehicle parking out with activated direction
indicator projectors



Demonstrated Use Case 2: Parking in and out of a parking space parallel to road

Purpose and Key Take-Away:

- 1) Demonstrate usefulness of reversing projection in combination with front and rear direction indicator projection
- 2) Demonstrate perception of a cyclist, who is being overtaken by a car
- 3) Demonstrate usefulness of direction indicator projection during parking out maneuver

Signaling road projections providing useful maneuvering information.



Signaling road projection already visible before start of maneuvering and leaving of parking space towards the driving lane.



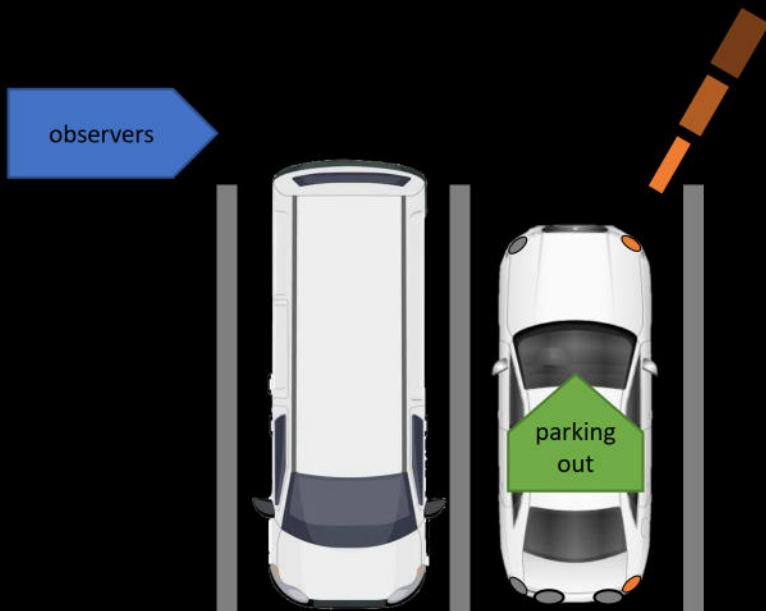
Direction indicator on vehicle visible, once vehicle is already leaving parking space.

Demonstrated Use Case 3: Forward parking out from behind a visual obstacle

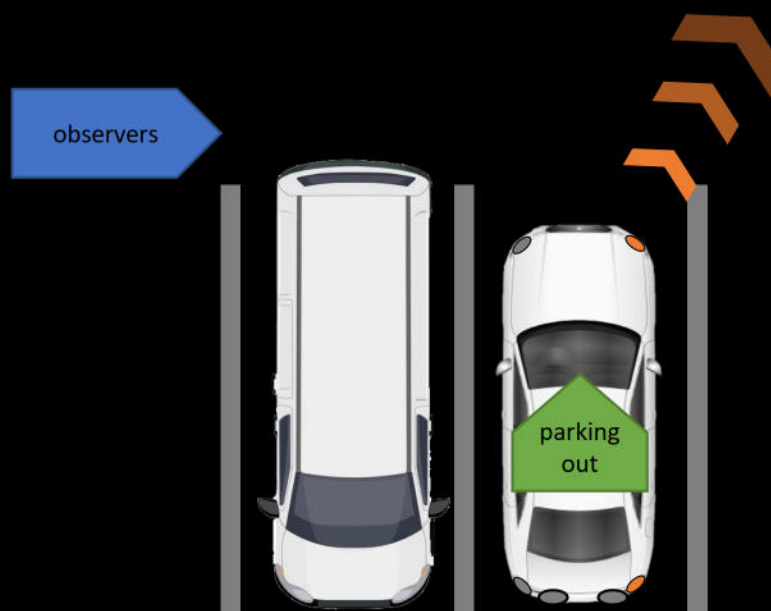
Purpose and Key Take-Away:

- 1) Demonstrate usefulness of front direction indicator projection with forward aiming direction (counterpart for reversing projection)
- 2) Demonstrate perception of direction indicator projection is well for simple and free-from shapes, if dimensions and sharpness are well defined
- 3) Demonstrate direction indicator projection with sequential element activation

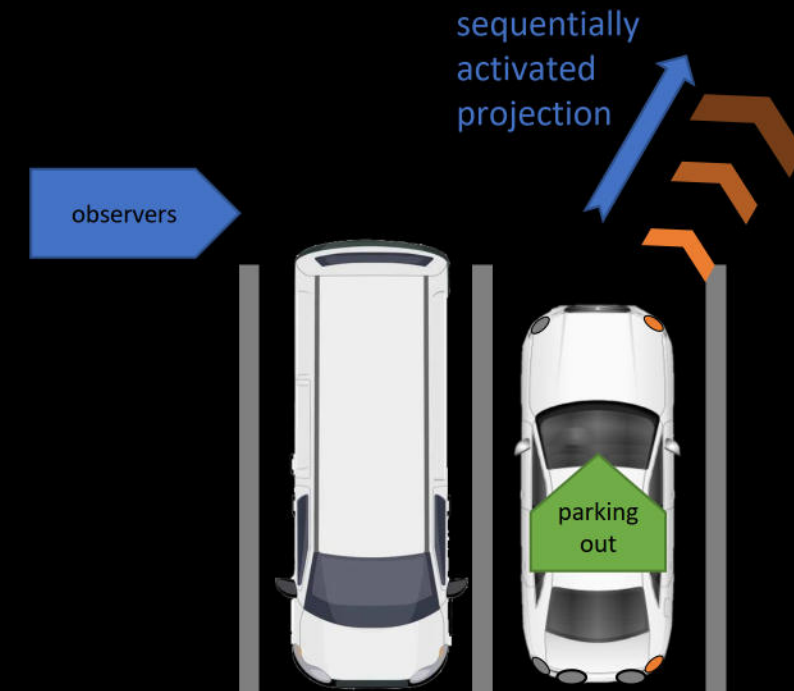
A) Direction indicator projection flashing with dotted-lines shape



B) Direction indicator projection flashing with simple geometric shape



C) Direction indicator projection seq. activated with simple geometric shape

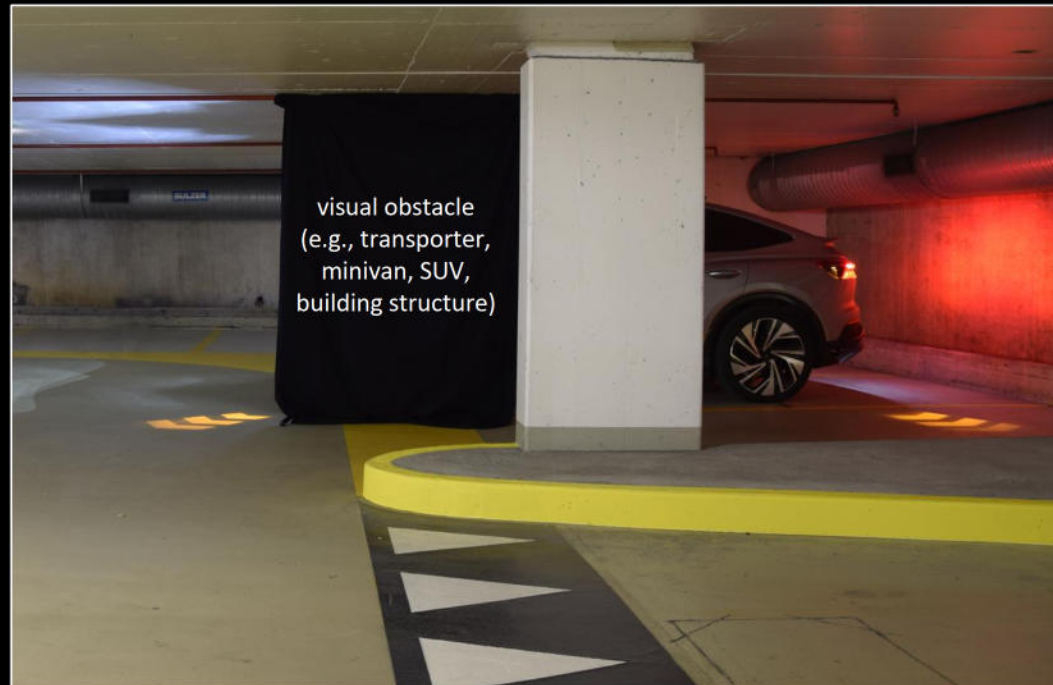


Demonstrated Use Case 3: Forward parking out from behind a visual obstacle

Purpose and Key Take-Away:

- 1) Demonstrate usefulness of front direction indicator projection with forward aiming direction (counterpart for reversing projection)
- 2) Demonstrate perception of direction indicator projection is well for simple and free-from shapes, if dimensions and sharpness are well defined
- 3) Demonstrate direction indicator projection with sequential element activation

Maneuvering vehicle not directly visible, but forward pointing DI projection is.



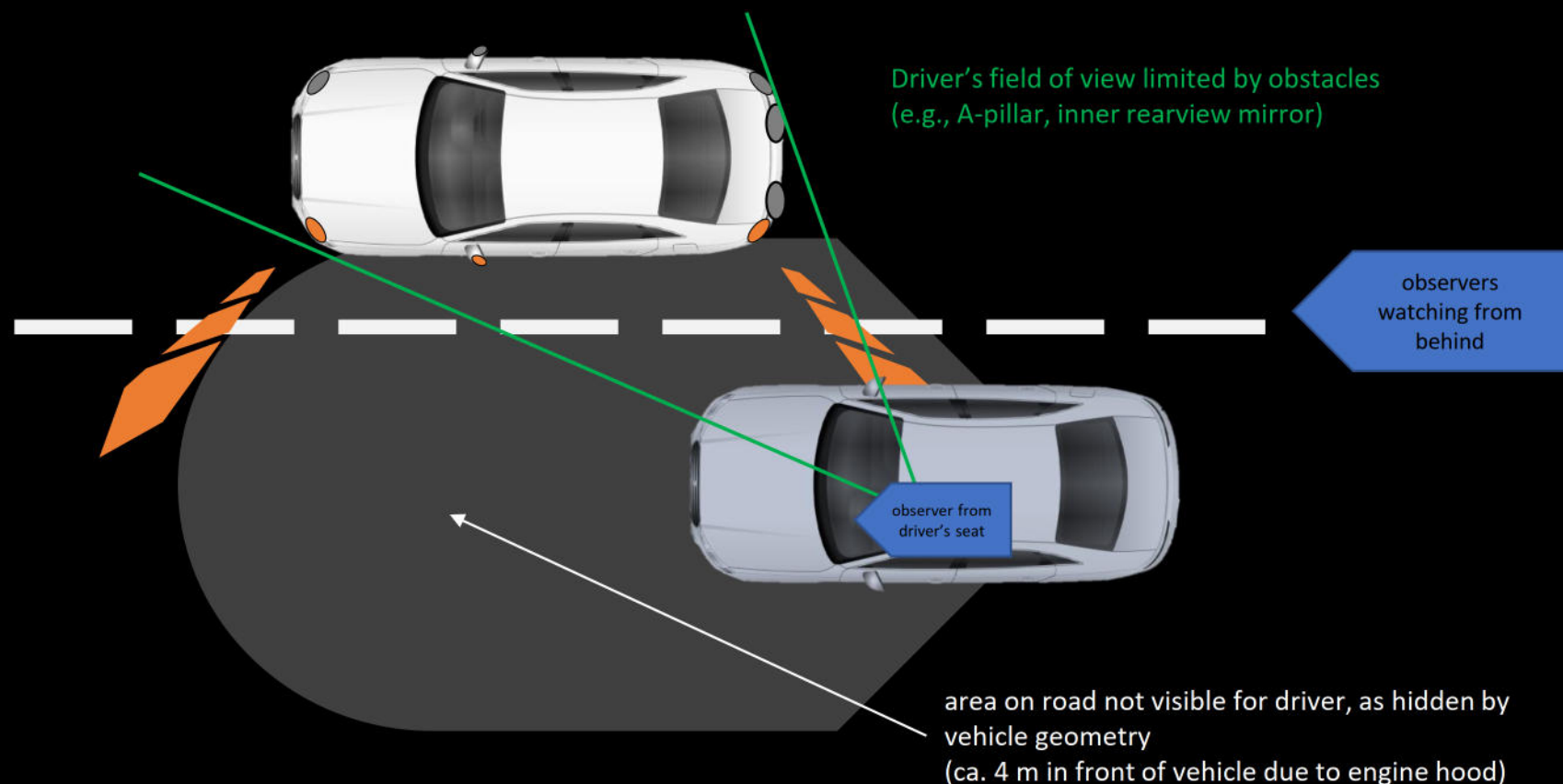
parking out sequence



Demonstrated Use Case 4: Lane changing

Purpose and Key Take-Away:

- 1) Demonstrate usefulness of front direction indicator projection during lane changing and conflict lane situations
- 2) Remind of similar situations to occur in urban and outside of urban areas with low relative vehicle velocities and when facing multiple lanes



Demonstrated Use Case 4: Lane changing

Purpose and Key Take-Away:

- 1) Demonstrate usefulness of front direction indicator projection during lane changing and conflict lane situations
- 2) Remind of similar situations to occur in urban and outside of urban areas with low relative vehicle velocities and when facing multiple lanes



Driver's field of view reduced by vehicle geometry, limiting the visibility onto signaling functions of vehicles on other lanes.



Vehicle arrangement, as often experienced on multi lane roads with low relative vehicle velocities.

