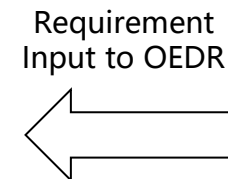
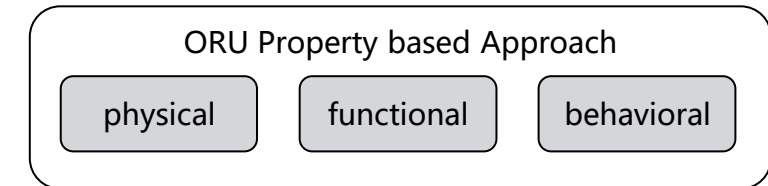
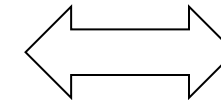
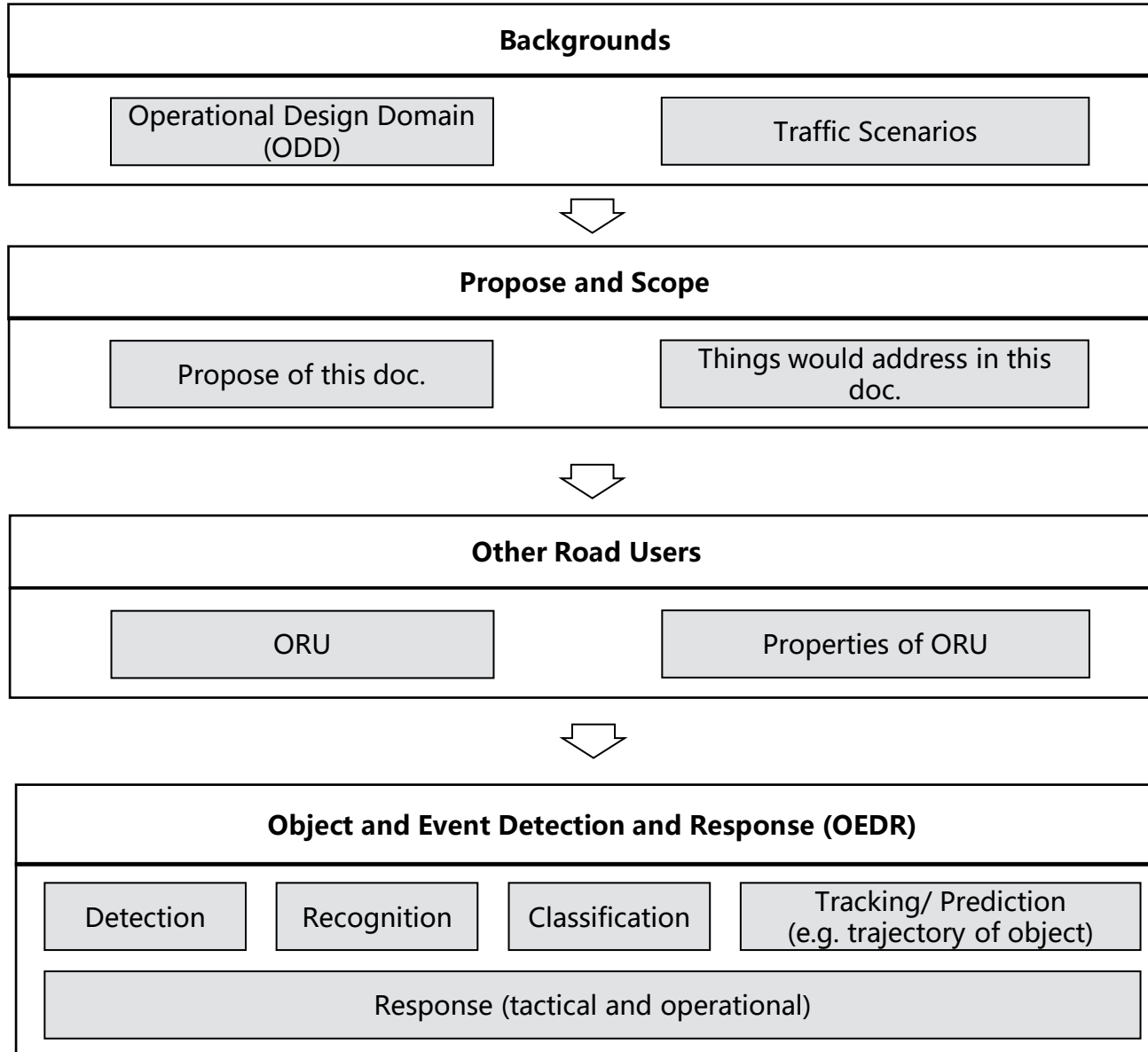
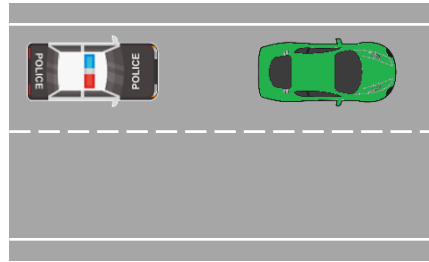


OEDR Framework concerning interaction safely with other road users

Document FRAV-24-07
Submitted by the ORU safety workstream leader
24th FRAV informal group session, 8 February 2022

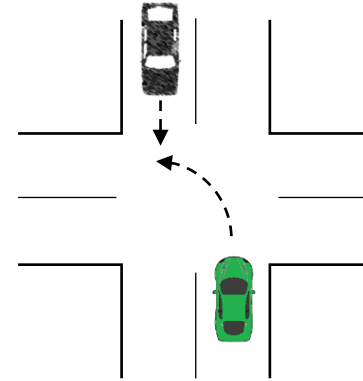


Example 1:
Ego vehicle lane keeping while encountering the priority vehicle [1]



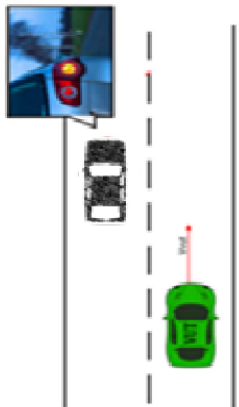
Ego	w TOR	w/o TOR
Detection	✓	✓
Recognition	✓	✓
Classification	✓ (in task)	✓ (in task)
Tracking/ Prediction		✓
Response	Ego issues TOR	Ego gives the right of way

Example 2:
Ego vehicle turning at intersection while encountering other road user [2]



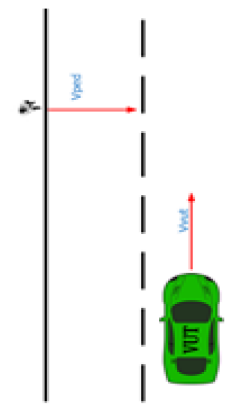
Ego	w & w/o TOR
Detection	✓
Recognition	✓
Classification	✓ (normal vehicle)
Tracking/ Prediction	✓ (the trajectory of object vehicle)
Response	Ego maintains the safe time margin with the object when passing through the intersection area

Example 3:
Ego vehicle lane keeping while encountering front vehicle turning [3]



Ego	w TOR	w/o TOR
Detection	✓	✓
Recognition	✓	✓
Classification	✓ (normal vehicle)	✓ (normal vehicle)
Tracking/ Prediction	✓	✓
Response	Ego issues TOR	Ego slow down until the completion of ORU turning

Example 4:
Ego vehicle lane keeping while encountering a VRU crossing [3]



Ego	w TOR	w/o TOR
Detection	✓	✓
Recognition	✓	✓
Classification	✓ (VRU)	✓ (VRU)
Tracking/ Prediction	✓	✓
Response	Ego issues TOR	Ego slow down until the completion of VRU crossing



Ego vehicle



Other vehicles part of the scenario



pedestrians

[1] GRVA-12-23, 2.14

[2] GRVA-12-23, 2.13

[3] FRAV-17-09

The detailed provisions under the OEDR Framework would be:

No.	Safety Recommendations	Detailed Provisions (under discussion)
The ADS should drive safely (based on the informal document GRVA-12-23)		
3	The ADS shall detect and respond to objects and events relevant to its performance of the DDT.	<ul style="list-style-type: none"> • Objects and events might include, but are not limited, to: <ul style="list-style-type: none"> ➤ Vehicles, motorcycles, bicycles, pedestrians, obstacles ➤ Road accidents ➤ Road safety agents / enforcement agents ➤ Emergency vehicles • The ADS shall detect objects in and around its path of travel that exceed a minimum size. • The ADS shall recognize objects as static or mobile. • The ADS shall recognize markings and signals used to indicate priority vehicles within the ODD of its feature(s). • The ADS shall classify priority vehicles within the ODD of its feature(s) in accordance with the relevant traffic law(s). • The ADS shall yield the right of way to priority vehicles in service in accordance with the relevant traffic law(s). <ul style="list-style-type: none"> -> <i>The ADS shall respond the priority vehicles appropriately in accordance with the relevant traffic laws, the response may include:</i> <ul style="list-style-type: none"> ➤ <i>Issuing a transition demand if the ADS permits a transition of control, or</i> ➤ <i>Giving the right of way to the priority vehicle</i>
5	The ADS shall interact safely with other road users.	<ul style="list-style-type: none"> • The ADS shall avoid collisions with safety-relevant objects where possible. <ul style="list-style-type: none"> -> <i>The ADS shall maintain the safe time margin with the object when passing through the intersection area</i> • The ADS shall signal intended changes of direction. • The ADS shall signal its operational status (active/inactive) as needed.

Next step & plan:

- Build out OEDR framework based on FRAV discussion and experts' suggestions;
 - ORU properties;
 - OEDR hierarchy requirements;
 - External signaling issues;
 - ...
- Elaborate pending issues related to ORU:
 - Clarification of ORU
 - Consideration on animals
 - ...