

## Motivation

**Sensor Setups:** Sensor setups vary significantly depending on the *type* of autonomous vehicle.

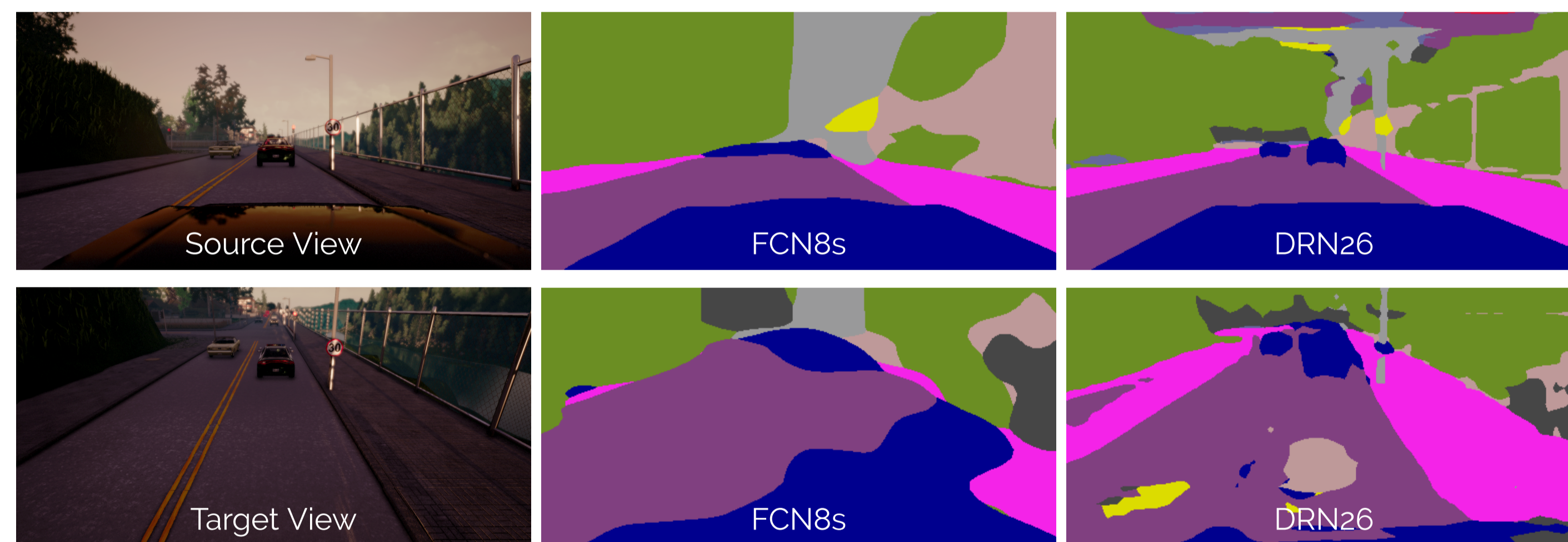


Car



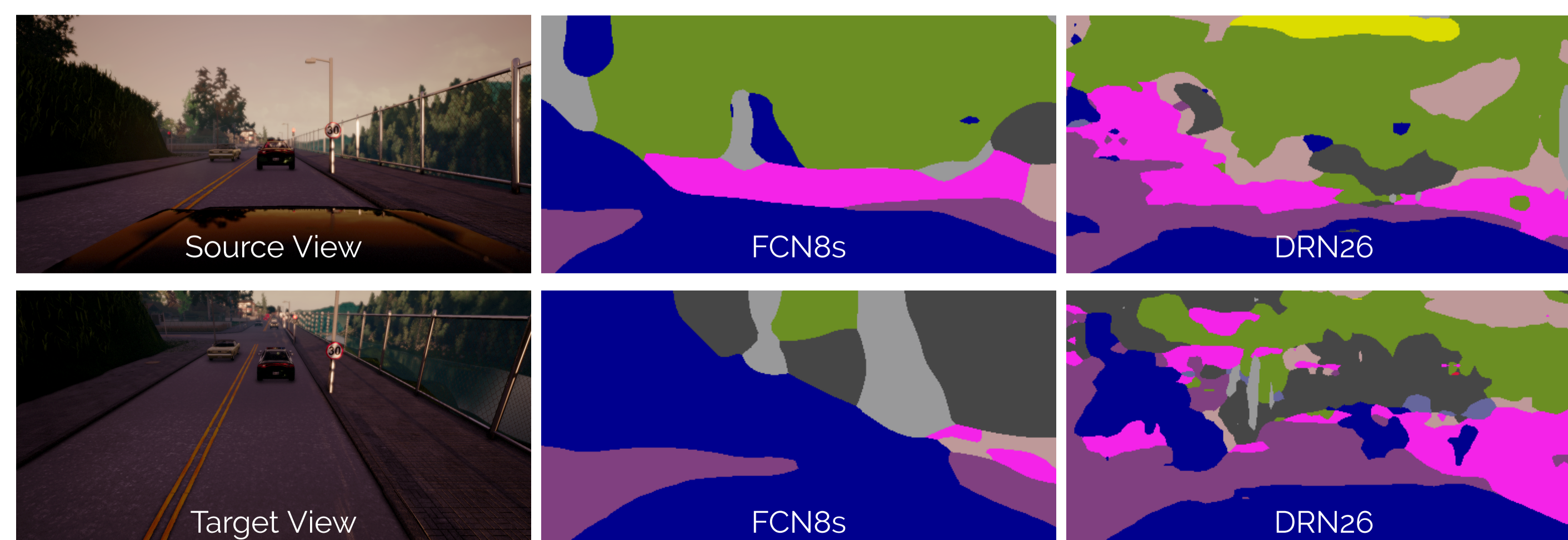
Truck

**Generalization Challenge:** Deep neural networks do not generalize well to novel viewpoints.



Source Model

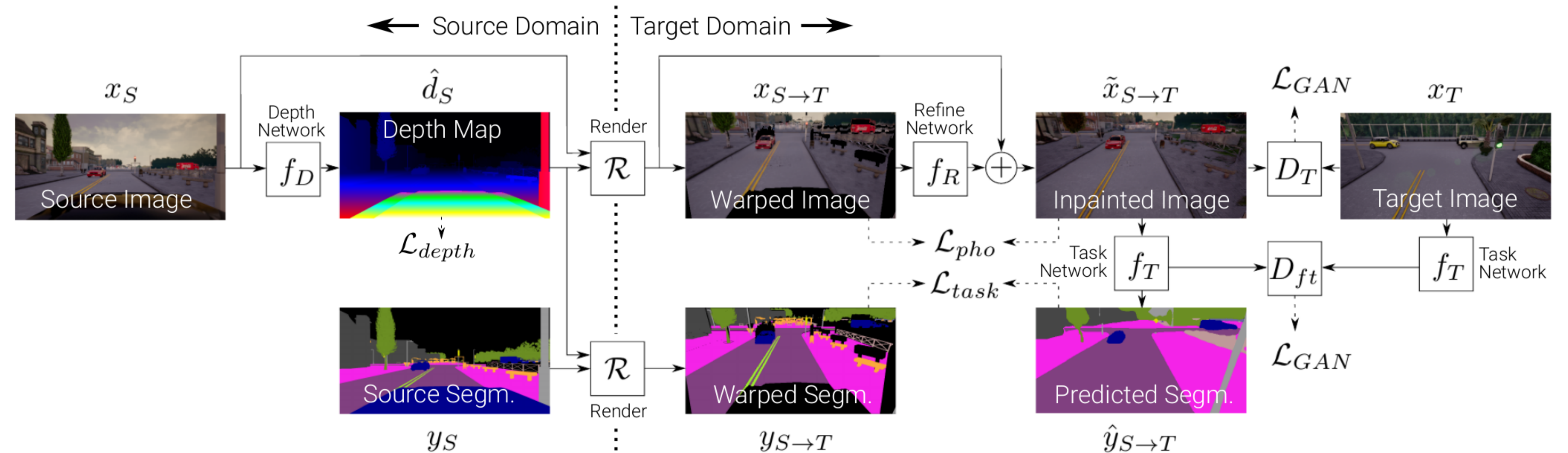
**Domain Adataptation:** Enables an adaptation to a novel domain (i.e. style) but not to a novel viewpoint.



Cycle-Consistent Adversarial Domain Adaptation

## Method

**NoVA Pipeline:** Depth Estimation → Forward Warping → Image Refinement → Task Network Training



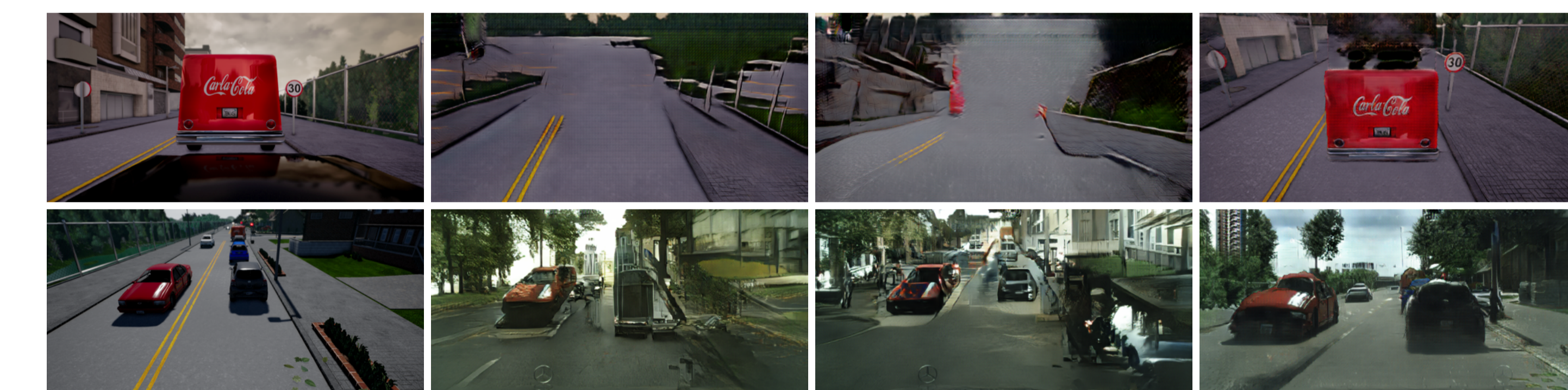
## Quantitative Results

Method	mIoU	fwIoU	pixAcc
Source Only	26.54	43.56	55.82
SceneAdapt [Mauro et al., AVSS 2018]	26.63	54.65	68.15
CyCADA [Hoffman et al., ICML 2018]	10.57	21.44	30.36
SPLAT [Tzeng et al., arXiv 2018]	13.63	22.77	32.26
<b>NoVA</b>	<b>51.89</b>	<b>78.66</b>	<b>86.69</b>
Target Oracle	52.72	79.96	87.81

Method	mIoU	fwIoU	pixAcc
Source Only	18.84	37.34	47.59
SceneAdapt [Mauro et al., AVSS 2018]	11.54	30.65	37.23
CyCADA [Hoffman et al., ICML 2018]	19.26	43.90	56.43
SPLAT [Tzeng et al., arXiv 2018]	21.01	49.42	60.99
<b>NoVA</b>	<b>35.91</b>	<b>69.52</b>	<b>80.84</b>
Target Oracle	51.30	79.82	88.36

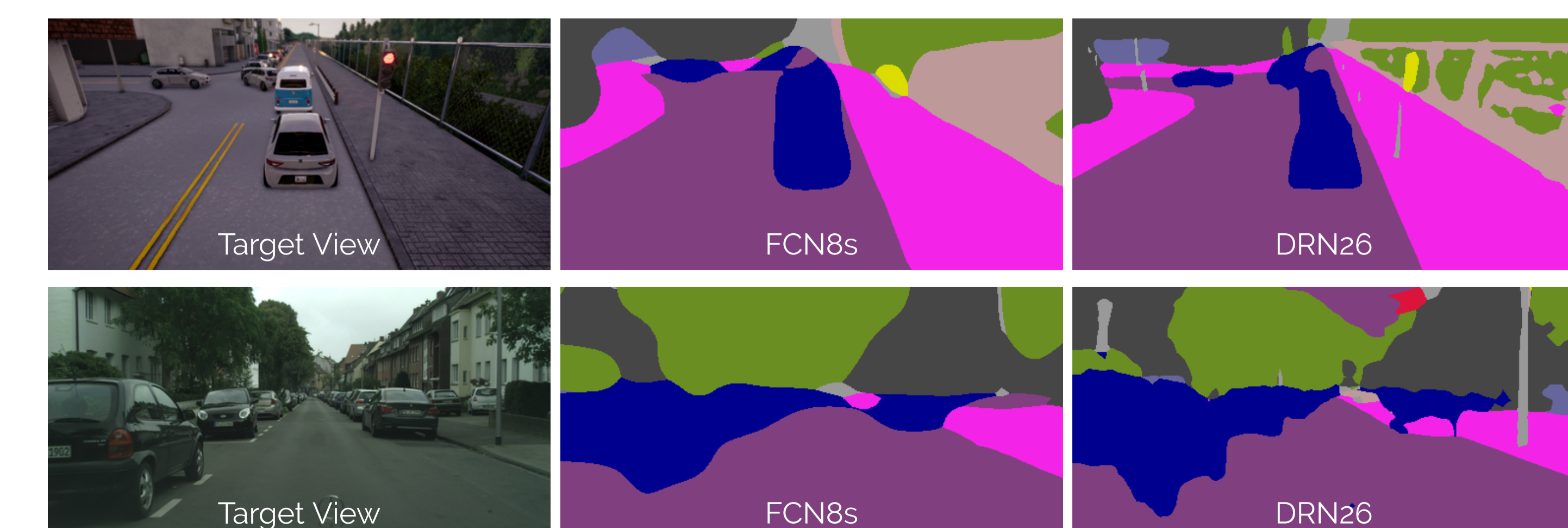
## Qualitative Results

**Viewpoint Translation on Sim2Sim & Sim2Real:**



Source CyCADA SPLAT NoVA

**Semantic Segmentation on Sim2Sim & Sim2Real:**



Target View FCN8s DRN26