In this appendix, we introduce more details of MLDAS firstly (Sec. A). Then, we provide more experiments results (Sec. B). Finally, we show the visualizations of scenes in MLDAS and Place C (Sec. C).

A Dataset Details

The MLDAS is a multi-LiDARs semantic segmentation dataset crafted to tackle domain adaptation challenges related to cross-sensor and cross-scenario. As outlined in Table 7, existing LiDAR semantic segmentation datasets such as SemanticKITTI [Behley *et al.*, 2019], SemanticPOSS [Pan *et al.*, 2020], nuScenes [Caesar *et al.*, 2020], are equipped with a single type of LiDAR and are not explicitly designed for semantic segmentation domain adaptation (SSDA). Similarly, datasets like SynLiDAR [Xiao *et al.*, 2022b], SemanticSTF [Xiao *et al.*, 2023b], Waymo [Sun *et al.*, 2020] are tailored to address different DA challenges but offer only a single type of LiDAR data. In addition to field of view, different LiDAR brands has different ranging capabilities and accuracy, shown in Table 8. In MLDAS, we annotated 14 categories in two scenes, including: *car, bicycle, pedestrian, rider, road, sidewalk, building, fence, vegetation, trunk, pole, sign, board, other-object*. *sign* includes traffic signs and other signs mounted on poles. *board* includes billboard, signboards, etc placed on ground.

Dataset	MS LiDAR(beams) Low	MS LiDAR(beams) High	Anno. Frames	Classes	Scene Type	G&I	Real	DA
SemanticKITTI	-	64	43k	19	urban	✓	✓	✗
SemanticPOSS	40	-	2.9k	14	campus	✓	✓	✗
nuScenes	32	-	40k	16	urban	✓	✓	✗
SynLiDAR	-	64	198k	32	synthetic	✗	✗	✓
SemanticSTF	-	64	2k	21	urban	✗	✓	✓
Waymo	-	64	32k	23	urban	✓	✓	✓
RELLS-3D	32	64	13k	20	off-road	✓	✓	✗
PandaSet	-	64	6k	37	urban	✓	✓	✗
MLDAS	32	64, 128	31k	14	urban, campus	✓	✓	✓

Table 7: Comparison with existing LiDAR semantic segmentation datasets. "G&I" denotes GNSS&IMU. "Real" refers to whether the dataset is real or synthetic. "DA" refers to whether the dataset is designed include DA task.

LiDAR Brand	Hesai XT32	Ouster OS1-128(64)
Ranging Capability	80m @ 10% reflectivity	60m @ 10% reflectivity
Ranging Accuracy	2 cm	5 cm
Ranging Precision	2 cm	3 cm

Table 8: LiDAR attributes with different brands.

B Additional Results

Results on cross-sensor&scenario. As shown in Table 11, 12, we observe that the proposed HSSC consistently outperforms and lead to improvements of +10.16 mIOU and +6.44 mIOU over the second best results respectively. In addition, we provide adaptation results on OS64 data, as illustrated in Table 13, 14. Once again, the results demonstrate the effectiveness of our approach in addressing the cross-sensor&scenario challenge.

Results on cross-sensor. In the experimental setup on cross-sensor investigations, the merits of our approach become more pronounced. It stands out with a substantial lead in mIOU and consistently achieves the best results in IOU across all categories, as illustrated in Table 15.

Results on cross-scenario. In the experimental on Campus(XT32)→Street(XT32), we also replaced Street(OS64) as an intermediate domain. The results are shown in Table 10. Compared with Table 5 (in Main paper), we can see that utilizing OS128 data as the intermediate domain imporved the mIOU of our HSSC from 50.36 to 52.01. We thus chose the OS128 data in our submission. In MLDAS, the class distribution disparity presents a challenge for cross-scenario domain adaptation. The results in Table 16 show that our approach HSSC exhibits much better results than other methods.

Results on ablation studies. We establish the intermediate domain based on MLDAS to narrow the gap between the source and target domain. In the experiments, we assess the efficacy of this intermediate domain for other methods. As illustrated in Table 9, the intermediate domain contributes to the improvements for all methods.

#	Methods			
	ST	CosMix	PolarMix	SCT
w/o inter.	29.46	31.97	34.50	31.37
w/ inter.	31.17	35.03	35.03	36.80
Δ↑	+1.71	+3.06	+0.53	+5.43

Table 9: Ablation studies on the effectiveness of intermediate domain. Experiments conduct on Street(XT32)→Campus(OS128), inter. refers to Campus(XT32).

Methods	mIOU
Source-only	48.20
ST	52.89
CosMix	49.59
PolarMix	48.90
SCT	47.68
Ours	50.36

Table 10: Adaptation results on Camnpus(XT32)→Street(XT32) using Street(OS64) as an intermediate domain.

C Visualization

In this section, we provide visualizations of scenes in the MLDAS. Furthermore, we show the scene Place C mentioned in Section 5.5 of the main text. Significantly, the data from Place C lacks annotations. as shown in Figure 6, Place C provides data with a distinct distribution compared to the MLDAS.

Method	mIOU	car	bicycle	pede.	rider	road	sidewalk	buil.	fence	vege.	trunk	pole	sign	board	oth-obj
Source-only	30.48	22.04	37.62	57.24	20.34	20.94	46.93	65.13	2.61	60.13	25.27	19.69	36.72	4.47	7.60
ST	31.17	23.53	29.37	55.72	30.92	15.74	44.01	64.52	8.84	54.81	29.90	29.74	33.71	9.86	5.62
CosMix	35.03	14.46	36.99	54.75	38.07	56.28	55.23	72.56	0.46	**72.04**	**35.42**	15.36	21.05	**12.62**	5.14
PolarMix	35.03	22.98	29.50	63.06	29.62	37.69	47.57	**76.99**	**9.65**	68.45	33.65	20.21	37.49	6.45	7.12
SCT	36.80	25.91	41.56	58.92	49.32	26.03	43.69	67.89	8.38	65.65	28.07	40.36	**41.63**	1.46	16.26
Ours	**46.96**	**54.34**	**50.10**	**73.67**	**68.76**	**73.29**	**59.60**	67.56	0.02	67.87	28.57	**43.06**	36.27	8.28	**26.05**

Table 11: Adaptation results on Street(XT32)→Campus(OS128). Campus(XT32) as intermediate domain.

Method	mIOU	car	bicycle	pede.	rider	road	sidewalk	buil.	fence	vege.	trunk	pole	sign	board	oth-obj
Source-only	36.66	13.54	42.05	51.95	46.73	58.09	52.86	79.24	0.07	71.15	28.59	18.57	28.55	12.78	9.01
ST	38.80	14.49	41.40	49.37	41.04	60.30	57.45	79.23	0.04	68.70	**43.63**	21.02	29.98	**30.33**	6.23
CosMix	36.23	8.39	40.58	53.35	42.53	46.87	38.21	71.77	**3.93**	65.83	40.79	**31.55**	29.06	21.53	12.79
PolarMix	38.46	10.80	31.41	60.12	**61.22**	70.09	**69.99**	79.02	0.17	69.44	31.2	17.02	13.65	7.95	16.32
SCT	37.07	11.14	42.13	54.51	49.44	54.12	48.97	78.63	0.04	70.23	22.61	22.23	36.28	17.73	10.91
Ours	**45.24**	**29.76**	**44.33**	**63.84**	54.87	**71.61**	64.47	**83.63**	0.03	**77.58**	39.20	20.85	**39.32**	26.48	**17.41**

Table 12: Adaptation results on Street(OS128)→Campus(XT32). Campus(OS128) as intermediate domain.

Method	mIOU	car	bicycle	pede.	rider	road	sidewalk	buil.	fence	vege.	trunk	pole	sign	board	oth-obj
Source-only	41.42	54.97	30.93	67.43	50.80	63.25	58.54	73.19	0.89	68.84	28.1	17.93	35.12	18.25	11.68
ST	43.02	58.92	27.75	66.28	**56.66**	66.69	59.01	72.84	2.28	64.08	**38.74**	20.09	34.98	**27.87**	6.01
CosMix	41.11	40.46	27.87	64.06	46.16	63.84	56.01	71.14	**4.98**	71.98	36.02	**28.88**	36.84	17.74	9.59
PolarMix	42.29	58.67	24.18	67.72	44.31	61.06	55.09	**82.32**	0.75	73.78	38.26	20.81	**39.25**	17.41	8.42
SCT	41.85	51.51	**35.59**	68.72	52.72	66.09	60.62	69.45	1.61	66.1	27.91	22.72	35.54	15.16	12.11
Ours	**46.20**	**65.25**	32.95	**70.62**	55.86	**68.65**	**63.35**	80.28	0.15	**75.95**	38.70	24.73	34.56	18.01	**17.71**

Table 13: Adaptation results on Street(XT32)→Campus(OS64). Campus(XT32) as intermediate domain.

Method	mIOU	car	bicycle	pede.	rider	road	sidewalk	buil.	fence	vege.	trunk	pole	sign	board	oth-obj
Source-only	32.03	62.26	8.48	40.76	29.28	45.50	33.92	87.83	0.46	54.36	32.36	8.37	32.12	10.10	2.66
ST	37.34	62.87	**42.49**	50.66	39.69	48.26	37.06	86.45	0.10	40.76	27.19	15.58	41.95	14.67	**15.03**
CosMix	39.70	75.32	24.41	50.23	52.91	56.30	40.60	86.08	1.07	59.98	**39.98**	9.28	32.14	**20.08**	7.35
PolarMix	36.63	73.72	21.20	42.95	23.45	60.76	37.69	88.22	0.17	64.54	39.32	7.75	38.32	7.51	7.22
SCT	34.14	72.40	8.99	44.40	38.53	47.57	36.87	89.28	0.14	53.09	36.21	5.49	33.32	8.69	3.02
Ours	**46.19**	**91.59**	13.45	**57.95**	**53.50**	**84.37**	**54.53**	**92.14**	**1.35**	**70.47**	38.64	**15.65**	**56.39**	8.39	8.28

Table 14: Adaptation results on Campus(XT32)→Street(OS64). Street(XT32) as intermediate domain.

Method	mIOU	car	bicycle	pede.	rider	road	sidewalk	buil.	fence	vege.	trunk	pole	sign	board	oth-obj
Source only	67.13	76.20	60.40	54.45	71.45	85.99	60.61	95.09	28.59	71.04	62.46	64.68	68.93	73.10	66.82
ST	72.35	87.50	70.19	55.47	68.38	88.87	66.76	95.90	39.73	79.77	71.22	67.65	62.78	75.45	83.29
CosMix	66.72	58.57	65.20	62.83	76.19	85.53	67.26	91.12	8.57	79.90	68.06	65.39	66.51	73.60	65.33
Polarmix	70.82	82.77	64.03	57.17	69.79	85.81	61.75	95.57	42.08	76.17	65.00	67.49	70.20	74.53	79.12
SCT	69.05	76.77	64.08	57.08	73.05	84.66	58.97	95.60	35.52	76.68	64.97	66.85	68.87	72.65	70.91
Ours	**78.67**	**94.43**	**71.39**	**64.53**	**77.50**	**92.65**	**75.11**	**97.35**	**48.74**	**88.60**	**75.66**	**71.52**	**74.75**	**83.83**	**85.35**

Table 15: Adaptation results on Street(OS128)→Street(XT32).

Method	mIOU	car	bicycle	pede.	rider	road	sidewalk	buil.	fence	vege.	trunk	pole	sign	board	oth-obj
Source-only	44.28	46.52	45.99	70.57	53.77	66.40	55.96	76.37	0.42	73.29	38.28	22.72	41.53	15.84	12.33
ST	44.78	42.43	33.57	67.74	41.87	**71.75**	56.25	**82.99**	5.44	73.56	48.62	24.25	39.25	**29.46**	9.77
CosMix	41.29	24.38	40.17	61.94	40.49	56.87	49.02	73.15	**21.94**	73.01	**48.94**	29.71	36.89	13.76	7.87
PolarMix	45.22	55.46	34.20	71.04	60.15	62.14	48.40	81.98	0.11	**76.46**	43.28	29.01	46.71	14.41	9.71
SCT	44.48	**58.21**	**52.03**	70.94	54.28	60.25	48.31	70.38	0.32	69.00	33.78	32.12	45.17	8.01	19.90
Ours	**48.49**	56.17	48.87	**71.92**	**61.12**	68.38	**60.16**	76.10	0.05	75.94	39.01	**35.60**	**47.90**	11.85	**25.80**

Table 16: Adaptation results on Street(XT32)→Campus(XT32).

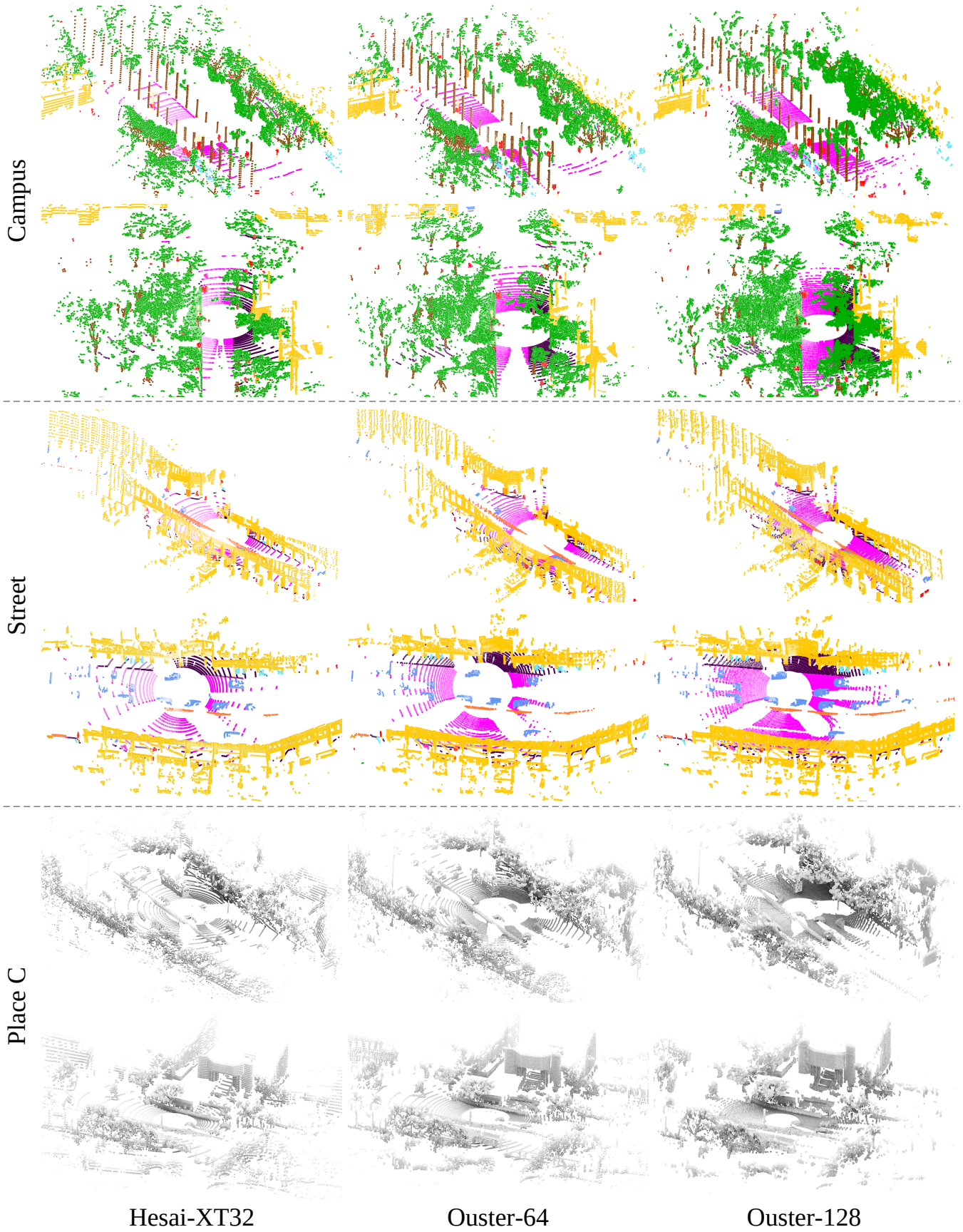

Figure 6: Visualization for the MLDAS(labeled) and Place C(unlabeled).